AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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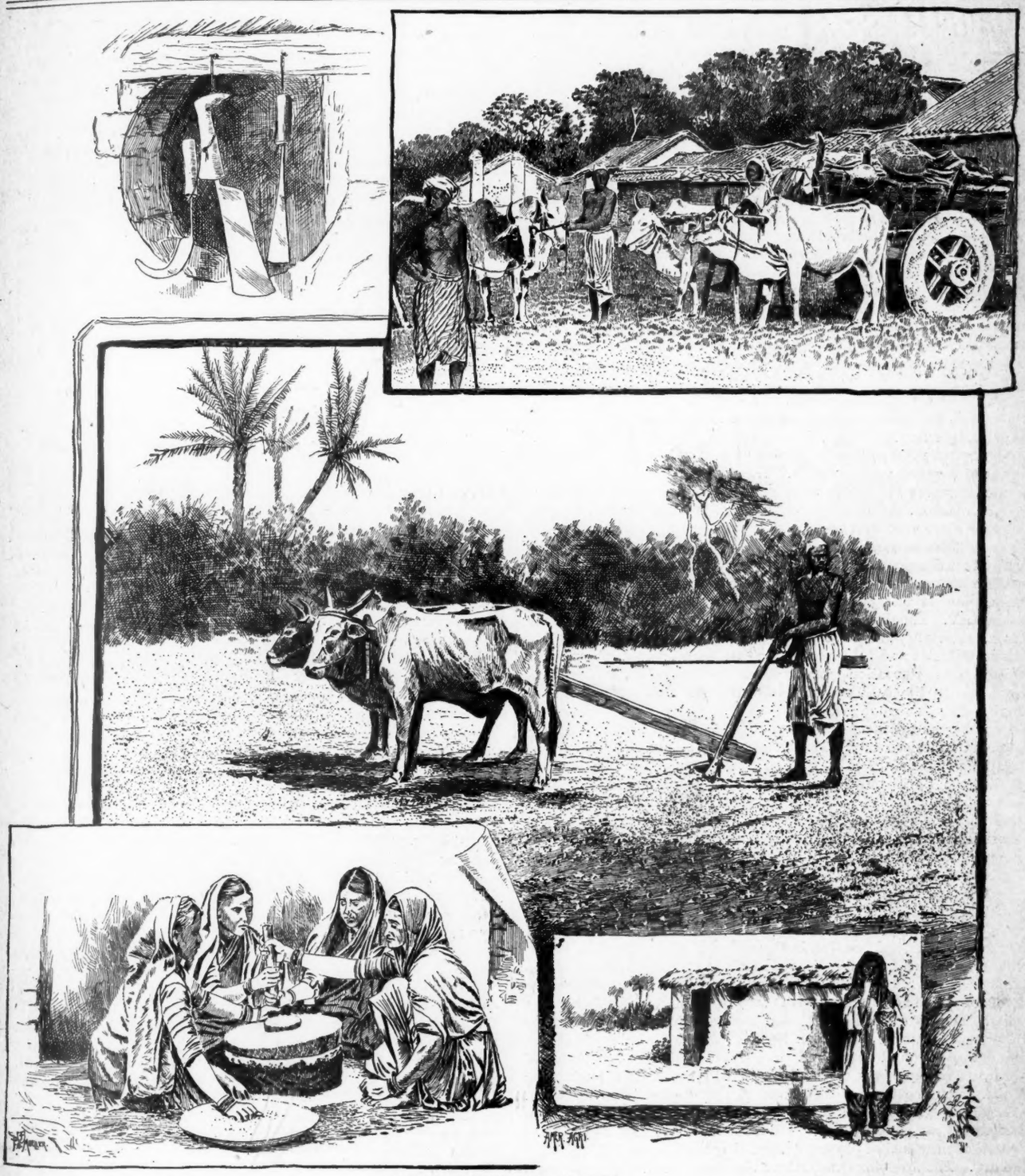

FARM LIFE IN INDIA.

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THE FARMERS OF INDIA.

FRANK G. CARPENTER.

INDIA is the land where the greatest part of the opium of the world is raised. It is a country where quinine is being experimentally cultivated. The Himalaya Mountains, which bound it at the north, are the home of the tea-plant; and Indian tea within the past three or four years has become more popular than that of China or Japan. India is the land of indigo. It is the land of coffee and spices. It is the land of rice. Its cotton competes with ours, and its tobacco is exported to Europe. India has a wheat-growing area as large as all the fields planted in wheat in the United States. It is increasing its wheat farms every year by irrigation, and its irrigation works are greater than those of any other country in the world. It is the biggest farm on the face of the globe, and if a fence could be built around its triangular borders each side would be 2,000 miles in length, or as long as from New York to Denver. This immense area is packed full of the hardest-working, most economical, and most persevering farmers on the face of the globe. The population of India is more than 250,000,000; and of every six men, women, and children in the world one lives in India. Of these masses fully 90 per cent are supported directly from the soil, and India has 58,000,000 men who get their living by farming, or nearly as many men as we have men, women, and children in the United States.

The density of the population can hardly be comprehended. In some of the provinces through which I traveled there were 1,280 persons, by actual statistics, living on each cultivated square mile. A square mile is a section of land, and it would make four of our farms of a quarter section each. The average of population in the United States is six people to each such farm, or twenty-six acres for each person. In these Indian provinces two persons had to exist off the products of every acre and 320 persons got their living out of each 160-acre farm. In some of the districts the people are so many that the population loses its actual increase and remains the same from year to year. Everywhere I found the farmers terribly poor, and everything connected with them was managed on a starvation basis. The masses wore nothing but two strips of thin cotton cloth, and eighty out of every hundred people went barefooted. About Calcutta and in Bengal, which contains some of the richest soil of India, starvation looked out of the dusky faces of the Hindoos, and in the 2,000 odd miles which I traveled through North India I did not see one man or woman who had calves on his or her legs as big as the biceps muscles of the arms of a healthy sixteen-year-old American boy. The laboring people are skin and bone, and it is wonderful how they work all day under the broiling sun of the tropics, with only a little bit of rice or gruel to eat and nothing but water to drink. In the opium districts I found farmers feeding their children opium to take away their hunger and to reduce their sensibility to the cold, and nowhere did I find the average farm-house better than the American pig-pen, and the majority of the farmers lived in low huts made of mud bricks dried in the sun.

The farmers in India do not live upon their farms. They exist together like bees in little villages, and you see these villages dotting the landscape on every side. They are made up entirely of these mud huts, and you find in them no street lamps, no big school-houses, no town-council halls, and none of the surroundings of the American town. The huts are from six to fifteen feet square, the roofs of which are thatched with straw or covered with thin earthen tiles. There are no chimneys, and the smoke finds its way out of the door or from under the eaves. Some of the better houses have low mud walls around them, and upon these walls you see lumps of brown cow-droppings about the size and shape of a buckwheat cake. You see tens of thousands of these cakes in every town. They ornament the sides of the huts as well as the walls, and when dried they are packed away in piles and are bought and sold. They constitute the fuel of the family, and they have been plastered there to dry. The droppings are gathered by the women, who carry them in baskets to the front doors of their homes, mix them with dirt and pat them into shape with their hands. Such fuel is used all over India, and the soil gets but little in the shape of fertilization.

The Indian farmer's wife seldom has a cooking-stove. She cooks upon the floor, and the floor is of mud. The walls are unplastered. The family have no chairs, and the chief piece of furniture is a rough wooden framework, over which cords are tied, forming a bed. The huts are so small that these beds are put outside during the day, and the beds are seldom more than four feet long and three feet wide. The farmer and his family lie spoon-fashion upon them, in the same clothes they wear in the day-time. If they would stretch out their legs they would have to hang them over the side of the bed.

There are no barns to be seen in the farming country of India, and in the past the wheat has been piled up on the ground until floods and rains have destroyed much of the crop. This will, however, be changed this year. I was told by our consul at Bombay that Chicago men had recently come to India to build a vast elevator system, which would result in the wheat being better taken care of and would increase the amount exported to Europe.

The farming tools of India are as rude as the dwellings. The plow is little more than a sharpened stick, and it is so light that the farmer carries it to his field on his shoulders. His furrows are mere scratches on the surface of the ground, but he goes over the field so often that the soil is thoroughly pulverized. In addition to his plow he has a hoe and a mattock, and these implements are the same as those used by his forefathers centuries ago. His whole farming outfit could be bought for ten dollars. He harvests some of his crops with a sickle, but the most of the wheat is pulled from the ground, and the stubble is always saved for feed for his cattle or for fuel. Nothing that can be burnt or eaten is ever wasted, and the weeds are saved for the cooking-fires.

The grinding of meal for the family is done in the same pristine way as described in the scriptures. The women move two stones about one over the other and the grain is crushed between them as shown in the frontispiece. There are no roller patent processes in the East, and throughout India, China, Japan, and Egypt I saw mills of this kind in use. It is generally supposed that the East Indians subsist entirely upon rice. This is a mistake. Only about one-fourth the population of India are rice-eaters. In the northern part of the country wheat is largely used, and millet is ground up everywhere and made into bread. Millet is in fact the staple food grain of India. It is raised throughout nearly the whole of Hindostan.

The East Indians are not stock farmers. The Hindoo peasants will have nothing to do with pigs or fowls. The only animals they keep are horses and cows, and the cattle all over India are of the sacred cow variety (*Bos Indicus*). These are magnificent animals, of a dove or light yellow color, possessing the aristocratic air of the well-bred Jersey and the big frame of the Holsteins and Shorthorns. They have great humps upon their shoulders, which rise fully six inches above the rest of the back and which, strange to say, look by no means out of place. One of these animals is seen in the accompanying illustration. The Hindoos worship these cows, and I visited at Benares a noted temple in which a hundred sacred bulls were prayed to every day. It was in the center of the city, and it looked more like a stable than a temple. Imagine a stone court about the size of a barn-yard, with an immense low band-stand in the center. Around the court let there be a row of stalls in which a hundred of these sacred bulls, with these big humps on their backs and with silky ears hanging down like those of a rabbit, stand with their heads toward the court. About the court other bulls are moving, and the sloppy, dirty stone floor is filled with men and women having the dark, handsome features of the Hindoos. They hold up their hands before the bulls and pray. Pretty girls feed them garlands of bright flowers, and at the edge of the court an old priest sits and puts a red mark on the forehead of each worshiper as he goes out. Now and then the bulls roar and stamp their feet, but as a rule they are as gentle as pet rabbits, and all of them are as fat as butter. The Hindoos rub the manure of these cattle over their floors, and they not infrequently put their urine upon their faces. They bring water from the Ganges and offer it to them, and they would much sooner eat their grandfathers than condemn themselves to damnation by chewing beefsteak.

Their scruples, however, do not prevent their using these cattle as beasts of burden, and, from Singapore to Bombay, I saw carts drawn by these beautiful shoulder-humped animals, and in many of the fields I saw men plowing with them. The only other beast in common use in India is the water-buffalo, which is as ugly as the sacred cow is beautiful. It seems to be a kind of cross between the pig and the hippopotamus, and it has wide, flat, curved horns, a neck which comes straight out from the shoulders, and a belly

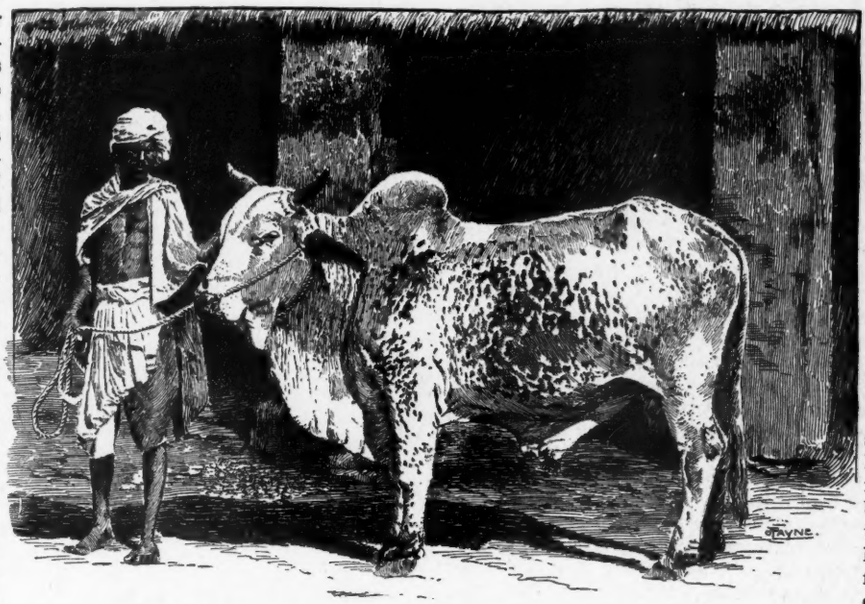
which is bloated and ill-shapen. Its skin is covered with thin straggling black hair, which looks more like the bristles of a hog than the hair of a cow. It delights in wallowing in the dirt, and it is the most plebeian species of the genus *bos*. The sacred cows are milked, and the butter made from them is clarified and used by the Hindoos for cooking. A Hindoo will never use lard or tallow in any shape, and the Sepoy mutiny was caused, it will be remembered, by the story being circulated that the cartridges which the Indian soldiers had to bite were greased.

One of the curious sights of India is the farmer's pleasure-buggy. It is a sulky-like affair, made of bamboo fishing-rods, and is covered with red cloth. It is drawn by one of these sacred bulls, some breeds of which are famous for their trotting qualities and which can make almost as good time as the average horse. The driver sits on the shafts in front, and there is just enough room under the cover at the back for one or two people to sit cross-legged. When a farmer wishes to travel from one part of the country to another he gets into one of these carts, and, if he is a wealthy man, he will have a richly-colored blanket to put over his bullock. I took a ride upon one of them and found it as easy as any sulky I have ever tried in America.

There are no fences about the farms of India. Wooden fences would be an impossibility, even if they were needed. The white ants are the great pest of the country, and these will eat up anything wooden. India has a vast network of telegraph lines covering the whole Peninsula, and the poles for these are made of galvanized iron. The ties of the railroads have to be made of iron, and such few fences as I saw along the railroads were made of barbed wire fastened to sandstone posts. The great wheat-growing districts of India are in the north, and in the northwest provinces about fifty-seven per cent of the country is used for wheat. The variety planted is not as good as that of Australia or California, but it is good enough to find a market in England, and the exports continue to increase from year to year. The English government is doing all it can to extend the wheat area, and I was told in India that the amount produced in the future would be much more than that of the past. The average is about thirteen bushels per acre, and, with the new elevator system, the amount saved will be much larger. The wheat is largely thrashed by being trodden out by bullocks and buffaloes. I saw but little flailing, and there are no big American thrashing-machines. India can raise wheat much more cheaply than we can. It costs the Indian farmer practically nothing to live, and farm wages are from six to eight cents a day. Whole families live on fifty cents a week, and I have never found a man more willing to work for small wages than the East Indian. There is little idleness among these 250,000,000 of people, and it is the only country in the world where the people seem to work all day, and every day, and to have nothing whatever but existence as their reward. Notwithstanding their crowded condition and their small farms, they are overloaded with taxes, and the main part of the great revenues which England collects from India comes from these farms. England gets $109,000,000 a year from these dusky living skeletons, and she pays her servants $15,000,000 a year to collect it. She divides up the land among them, as to many of the most profitable crops, so that one man cannot have a monopoly, and so that few can make more than a competency.

This is especially so as to the opium farming. The opium fields are all under mortgage to the government. The government officers give out the seed, regulate the amount of land that the farmer shall plant, and make him agree to sell his crop to the government at a certain fixed price. The theory they go on is that England owns the land and that the people pay a rent to her in taxes. The principle is, that the people should give the government one-third of their crops. It is true that they do not give nearly so much, but the taxes are out of all proportion greater than in England and America, and it is no wonder that the people are poor. The only wonder is that they exist at all.

[The accompanying engraving shows one of the sacred bulls and his attendant. Our frontispiece has for a central view an Indian peasant plowing. In the upper right-hand corner is a farmyard with country carts and bullocks; at the left is shown a native sickle, a grass-cutter, and a weeder. Below are four women grinding at a mill, and at their right a basket-maker. These illustrations are from photographs taken on the spot.]



THE SACRED BRAMNEE BULL OF BENGAL.

MORE POTATO-GROWERS' EXPERIENCE.

The main facts in the methods pursued by several more contestants in the Potato Class of the AMERICAN AGRICULTURIST Prize Crop Competition last year are given below. Most of these persons failed to win prizes, but there are certain points in their work that will be of value to all potato-growers, especially to the thousands who will compete for the generous prizes offered by the AMERICAN AGRICULTURIST in its potato contest for 1890. The few and simple rules of this new contest are reprinted further on in this number, being so arranged that any person who plants an acre or more of potatoes (Irish) may enter the lists.

The trench method was pursued by Mrs. L. D. Collingwood, wife of the associate editor of the *Rural New Yorker*, by which the trench system has been much advocated. A typical worn-out soil was chosen,—a light, sandy loam, somewhat stony, naturally very dry, because on a low hill-top, and worth perhaps $80 per acre for farming purposes because of its nearness to market. It was plowed six inches deep, April 15th, at a cost of $3.50, a team weighing 1,600 pounds together being used, with an Oliver chilled-plow and Sherwood steel harness. The land was then worked with Clark's Cutaway harrow for three hours, first across and then lengthwise of the furrows, and smoothed with a wooden-toothed implement much like a Thomas harrow. Drills about six inches deep were made two feet ten inches apart, in which were dropped sets of at least two strong eyes each, cut from medium-sized potatoes. These sets were about a foot apart, some eight barrels of seed being used (costing $29.28), mostly Brownell's Winner. The planting was done by the human hand—"a good machine when connected with a sensible head." With his foot, the planter kicked a small quantity of soil over each set as dropped, without stepping on the potato. Then 1,600 pounds of Mapes Complete Potato Manure were scattered as evenly as possible all through the trenches, both above and around the soil covering the seed-pieces. The wooden harrow mentioned above was then drawn lengthwise along the drills, leaving them about half filled. When worked across the rows, the harrow seemed to do better work, but the horses spoiled too many seed-pieces, and hand-hoes were used to partly fill the rest of the trenches. Afterward, the trenches were filled a little at a time by running the cultivator close to the rows, thus throwing a little dirt around the plants at each working, until the whole surface was perfectly level.

When the vines were twelve to eighteen inches high, half a ton

more of the same fertilizer was strewn through the rows and worked in as lightly as possible with a Higganum horse-hoe, at the last cultivating. The acre was harrowed once, before the plants came up, to level a few rough places and kill the weeds. Breed's Universal Weeder should have been used twice or more to keep the soil mellow on the surface. The acre was hand-hoed twice, and hand-weeded at intervals. It was cultivated first when the plants were about two inches high, and thrice afterwards at intervals of ten days, the cultivator running shallow. Colorado beetles were fought with Paris green and plaster with only fair success, but no effective remedy was found for the flea-beetle, which did much damage early in the season, and evidently caused the vines to die prematurely. The season was the wettest ever known, and consequently most unfavorable for potatoes, and blight killed the vines six weeks ahead of their time. While, therefore, the yield was only 193½ bushels, and of course unprofitable, this was good, inasmuch as the crop on neighboring farms was a failure. It will be interesting to have this acre entered in the new contest.

PROFITABLE CROPS ON OLD LAND.

S. D. Greenleaf, who raised 307 bushels on an alluvial loam in Somerset Co., Maine, although his crops lost two months' growth by blight, is confident that his practice will produce nearly twice as much in a good season, although the land has been cropped for one hundred years. It cut only half a ton of hay in 1885, and the next season gave a fair crop of cucumbers, planted six feet apart each way, when fed with only a shovelful of dung per hill. In 1887 it yielded $50 worth of sweet corn besides the fodder, and received only 750 pounds of fertilizer. The same crop was planted in 1888; two cords of stable-manure were harrowed in after plowing, 500 pounds of fertilizer were broadcasted and harrowed in, and 150 pounds more used in the hill at planting. The corn was well cultivated and hoed, and but for frost would have produced $60 worth of sweet corn per acre. The treatment had, therefore, been only such as ordinary good farmers would follow, but the culture had been very clean, and weeds had not stolen the soil's fertility.

The acre was plowed six inches deep on May 15th, cross-plowed and harrowed twice the next day. Eight hundred pounds of Stockbridge Potato Manure were broadcasted with the Strowbridge sower before each harrowing, making 1,600 pounds in all. The acre was furrowed out three and a half feet apart, 200 pounds of the fertilizer strewn in the drills and slightly covered with earth, the sets (two eyes) dropped one foot apart, covered lightly with the hoe, 200 pounds more of fertilizer scattered along the drills, and sufficient soil hoed in to cover the seed two inches deep. Beginning as soon as the plants were up, the acre was cultivated once a week until the last of June, when a furrow was run through each row and more fertilizer strewn in it and covered with soil. Twelve barrels of the Red Rock variety were planted, yielding 306 52-60 bushels, worth (at seventy-five cents for the marketable tubers) $229.50. The expenses were $84, as follows: Interest, $3; plowing and harrowing, $5; fertilizers, $50; applying the same, $1; cost of seed, $6; planting and cultivating, $9; harvesting, $10. An adjacent acre similarly treated produced 281 1-6 bushels of the Garnet Chili variety.

PECULIARITIES OF CULTURE UNDER IRRIGATION.

An upland sandy loam that had been in alfalfa for ten years was the acre selected by H. Stratton, Larimer Co., Northern Colorado. The alfalfa getting pretty thin, oats were sowed in 1888 after going over the land with a Cutaway harrow, and yielded fifty bushels per acre, though the soil had never been manured. It was plowed April 12th, 1889, seven inches deep, with a Grand Litour plow and three horses, requiring six hours, at a cost of five dollars. The same team was used to harrow it twice the next day. Twenty-five good-sized two-horse loads (forty-two cubic feet per load) of manure from alfalfa-fed horses had been spread on the sod in March. A compost was made by mixing 450 pounds of fine bone meal, 650 pounds of hen-droppings, 500 pounds of good soil, and 200 pounds of plaster, or gypsum. This analyzed (by Prof. Brine, of the Colorado Agricultural College) 8.57 per cent of phosphoric acid, 4.11 per cent of nitrogen, and a trace of potash. The potato being a great feeder on potash, this compost would have been vastly improved by the addition of several hundred pounds of dry wood-ashes. Half of this home-made fertilizer was broadcasted and harrowed in just before the rows were marked out three feet apart. Furrows were opened with a single shovel-plow, stirring the soil ten inches deep, and the seed was put in (May 6th and 7th) by the Aspinwall potato-planter, set to drop ten inches apart in the row, and covering with five inches of soil. Sixteen bushels of Rose Seedling, grown on the same farm, were used, cut to two eyes in pieces of uniform size, discarding the seed end. An average 100 sets weighed six pounds. One row planted a month later yielded one-third less than the early planting. The other half of the fertilizer was broadcasted on six days after planting and worked in with a Breed's Universal Weeder. The plants appeared June 1st, the weeder was used on the 4th, a five-tooth cultivator run once in a row June 12th and 22d, and a winged shovel plow June 28th. The acre was irrigated by running water through the rows the first week in July, but a slight rise in the ground caused the water to set back for nearly 100 feet where first turned on before it could be forced through the rows. This ground, therefore, baked and stopped the growth, and doubtless cut down the crop 100 bushels. It is a recognized principle with experienced irrigators that potatoes should be wet only from the bottom of the row. The acre was cultivated with a winged-shovel-plow July 13th, before the ground got dry, irrigated again July 20th, and for the last time on August 20th. The field was hand-weeded July 4th to 6th, and again August 10th. The tops completely covered the ground when the rust began to appear, August 25th, and, had the crop been planted late, the effect of the blight would have been still more disastrous.

The crop was dug with the Hamilton potato-digger, plowing out each row as deeply as could be done without covering the potatoes: "The digger works fairly, but leaves the potatoes too much scattered and covered,—and I have improved it by adding another set of fingers which extend six inches beyond the original set." The tubers were picked up, the rows again plowed, and finally the piece was harrowed, yielding 306¾ bushels. The harvesting took fourteen and one-half days' labor, worth $17.50, and eleven hours' work by team, worth $2, and the cost of sacks was $9.92, making the total harvest cost $29.42. The other expenses are thus stated: Manure, $6.25; applying the same, $7; value of fertilizer, $20; cost of applying it, $2.50; planting, $2.50; seed, $8; replanting, $2; cultivating, $8; irrigating, $6; plowing, $3; hand-weeding and harrowing, $5.75; total, $100.42. The merchantable tubers sold at $1.10 per hundred weight, netting $148.72, and 4,000 pounds fit for seed were valued at $40—a total of $188.72. Here is a handsome balance on the right side, however viewed, and justifies Mr. Stratton's idea that intensive culture pays; for neighboring crops grown by ordinary methods were only one-fourth of the average. He also adds: "I find there is quite a difference between guessing at the cost of a crop and the actual figures."

VALUABLE TIMBER-TREES.

ROBERT L. DEAN, OHIO.

If the indiscriminate destruction of forests continues many years longer, the loss of certain varieties of timber will be keenly felt. Though new growths appear in many locations where cultivation has been abandoned, yet these are mostly of inferior varieties, of little value except for fuel. The burr oak is slowly disappearing before both the ax and the decay that follows maturity. Unfortunately, this variety does not perpetuate itself spontaneously to the extent that less valuable varieties do. For the requirements of the farm, scarcely any kind of timber surpasses the burr oak. From its straight-grained trunks material is easily split for various purposes. The fence-posts are not only straighter and more easily faced, but more durable than when taken from most other varieties of timber. For whiffle-trees and wagon-poles, the butt of a young burr oak can hardly be surpassed. The burr oak and white oak usually furnish more lumber for the farm than all other species of timber, yet they seem destined to become very scarce in a few years. Black-walnut timber may no longer be used for fences or buildings, but it will soon be well-nigh impossible to obtain it, except at extraordinary prices. Many farmers are cutting out their hard-maples, because the wood brings a high price. This, together with the decay of old trees, and the failure to replace them, will greatly diminish the production of maple sugar and syrup. There are numerous inducements for planting groves of sugar-maples on land that is unfavorable for culture. This has already been done with success in various parts of the country, and the owners consider the enterprise a most happy one.

Of late years a strong demand has sprung up for the wood of the linden or basswood. This timber is quite light and white, which makes it attractive for various wares, while the texture allows it to be easily shaped into various forms. Manufacturers of bee-keepers' supplies consume large quantities of this wood for honey sections. Not only is its timber very useful, but the bloom of the trees yields an abundance of nectar for honey.

PERCHERON HORSES IN AMERICA.

Percheron and other French draft-horses have become an important acquisition to the horse stock of this country. Their introduction was not a chance hit, but the work of wide-awake, intelligent Americans, who had carefully observed these horses in France. They had seen them harnessed to heavy, lumbering diligences, moving rapidly over the country roads, or hundreds of them, untouched by the knife, standing quietly in the great omnibus stables of Paris. These men recognized in them a combination of massive strength with activity; of spirit with docility. The first importations to the United States were very successful, and the business of importing and breeding Percheron and other French draft-horses has attained immense proportions. The breeding establishments are scattered throughout the country, from the Atlantic to the Pacific, and some of the larger ones have hundreds of pure-bred stallions and mares in their stalls or pastures. The effect of this valuable addition to American horse-stock is seen in both city and country. French horses and their grades are largely used for draft purposes in all the cities. Perhaps it is not too much to state that the larger proportion of draft-horses employed in Chicago and some other cities are of French origin. On large farms, these horses prove well adapted to gang-plows, and other improved implements.

The Percheron is not claimed to be a perfect or a general-purpose horse. It cannot trot like Axtell, or Maud S., and possibly may not be able to move as heavy a load as the Suffolk Punch, English Shire, or Clydesdale. It is not adapted to light driving, either for business or pleasure. But the Percheron has a place of its own, which it fills as it can be filled by no other breed. From its Arab ancestry it inherits compact bone, clean limbs, and high spirit; from ages of careful breeding and kind treatment the race has acquired finish and docility. Charles Du Hays writes concerning it as follows: "To no ordinary strength, to vigor that does not degenerate, and to a conformation that does not preclude elegance, it joins docility, mildness, patience, honesty, great kindness, excellent health, and a hardy, elastic temperament. Its movements are quick, spirited, and light. It exhibits great endurance, both when hard worked and when forced to maintain for a long time any of its natural gaits, and it possesses the inestimable quality of moving fast with heavy loads. It is particularly valuable for its astonishing precocity, and produces by its work, as a two-year-old, more than the cost of its feed and keep. Indeed, it loves and shows a real aptness for labor, which is the lot of all. It knows neither the whims of bad humor nor nervous excitement. It bears for man, the companion of its labors, an innate confidence, and expresses to him a gentle familiarity, the fruit of an education, for many generations, in the midst of his family." No one who has become well acquainted with the Percheron race will say that this glowing tribute from its historian is undeserved.

The Percherons cross well upon our native mares, the small head of the stallion and the fact that colts by pure-bred Percheron stallions are always born small obviating any difficulty, even with small mares. A quaint but not unusual sight, in the Northwest, is a pony mare with her yearling grade-Percheron foal, standing fully a hand higher than its dam. The grades, if the dams are sound and of good conformation, inherit, in a large degree, the qualities of the paternal race.

THE IMPORTED PERCHERONS AGRICULTOR AND PLUVIOSE.

Our illustration portrays two imported Percheron stallions, from the Island Home Stock Farm of Savage & Farnum, Grosse Isle, near Detroit. The horse in the foreground is Agricultor 7848 (5247). He was foaled March 22, 1885; imported 1887. He is a dark gray; sixteen hands three inches high; weight, in fair breeding order, 1850 pounds. He is inbred to the great Percheron sire Coco (712). The leading horse is Pluviose 3755, foaled February, 1882, in the canton of Nogent-le-Rotrou, France, and imported 1884. Pluviose is a dark dappled gray, stands sixteen hands one inch high, and weighs 1810 pounds. His sire was Narbonne (777) by Brilliant (756). Both these animals are fine examples of pure-bred Percherons.

WHAT IS LOST IN BURNING MANURE.

JOSEPH HARRIS.

Mr. A. T. Taylor, of Los Angeles Co., California, asks us: "1. If dry horse-stable manure be burned and the ashes used, what fertilizer is lost? 2. What percentage of value is lost? 3. How can the fertilizing matter lost be most cheaply supplied?"

Clear horse-fæces, as dropped, contain 75 per cent of water, 21 per cent of organic matter, and 3 per cent of ash. The organic matter contains less than half a pound of nitrogen. If enough straw is used to absorb the urine, the manure is richer in nitrogen; contains about twelve pounds in a ton. When "dry horse-manure" is mentioned, it is difficult to determine what "dry" means. If it means absolutely dry, without any water, then a ton of the dry horse-manure would contain 1,700 pounds of organic matter and 300 pounds of ash; and if the nitrogen had not escaped in the drying process, the 1,700 pounds of organic matter would contain 35 pounds of nitrogen. If the manure contained 50 per cent of water, a ton of it would contain 850 pounds of organic matter, and 150 pounds of ash, and 17½ pounds of nitrogen. If it contained 25 per cent of water, the ton of manure would contain 225 pounds of ash, and 1,275 pounds of organic matter contains 26¼ pounds of nitrogen. The non-nitrogenous organic matter is supposed to have no direct fertilizing value, and, so far as furnishing plant-food is concerned, this is undoubtedly true. But it often has great indirect value. If we confine our attention to the 26¼ pounds of nitrogen in a ton of horse-manure containing only 25 per cent of water, it is not an easy matter to say just how much it is worth. The directors of our experiment stations agree to call nitrogen, in ammonia salts and in dried and fine-ground fish, blood and flesh, worth 19 cents per pound; in fine-ground bone and tankage, 16½ cents; in cotton-seed and castor pomace, 15 cents; in fine, medium bone, 13 cents; in medium bone, 10½ cents; in coarse bone, 8½ cents, and in horn shavings, hair and fish-scrap, 8 cents per pound. These figures represent the "trade value" of nitrogen in different substances. It will be seen that nitrogen in horn shavings and hair costs only 8 cents, while in dried blood and flesh it costs 19 cents per pound. Why? Because in the blood and flesh it becomes available as plant-food in a few months, while in the hair and horn it is much more slowly available. The same principle holds in regard to the trade value of phosphoric acid. In insoluble fine-ground rock phosphate, phosphoric acid can be bought for two cents per pound, while soluble phosphoric acid costs eight cents per pound. The difference in value is due solely to the degree of availability. One acts immediately, and the other slowly. The longer it lasts, the less is its commercial value.

In determining the comparative value of the nitrogen in stable-manure, we have first to ascertain its degree of availability. This is far from an easy matter. As a rule, the nitrogen in the urine is worth far more than the nitrogen in the fæces—for the reason that the one is soluble and immediately available, while the other is only slowly decomposed in the soil. If we call the nitrogen in the stable-manure worth 10 cents per pound, while it is worth 19 cents in blood and meat, we shall perhaps not be far wrong.

If the fresh horse-droppings contained, as they generally do, 75 per cent of water, the nitrogen in one ton would, at 10 cents per pound, be worth 88 cents; if they contained 50 per cent of water, the nitrogen in one ton would be worth $1.75; if they contained only 25 per cent of water, the nitrogen in a ton would be worth $2.62; if absolutely dry, the nitrogen in a ton would be worth $3.50.

When Liebig first advocated what was popularly called "the mineral manure theory," some of his enthusiastic supporters, it is said, claimed that it would be just as well to burn the manure and sow the ashes as to spend so much time and labor in drawing and spreading such heavy, bulky material. If plants got all the nitrogen they needed from the atmosphere, and the only elements of plant-food of any value were phosphoric acid, potash, and other mineral ingredients of plants, then, of course, they were right—the ashes of manure would be worth as much as the manure itself.

To test this matter in a practical way, Mr. Lawes, the first year of his since-celebrated experiments on wheat, applied fourteen tons of barn-yard manure (2,240 pounds per ton) on one plot, and on an adjoining plot the ashes of fourteen tons of similar manure. The result was as follows:

No. 1.	No manure	15 bushels per acre.
" 2.	14 tons barn-yard manure per acre	20¼ " " "
" 3.	The ashes of 14 tons manure	14¾ " " "

The ashes from the fourteen tons of manure did no good. Whether this would be the case on other soils, or for other crops, is an open question. A ton of fresh horse-fæces, containing 75 per cent of water, contains 7 pounds of phosphoric acid and 7 pounds of potash. The phosphoric acid is not soluble in water, neither is it as insoluble as that in rock phosphate. If we call it worth 5 cents per pound, and the potash worth 5 cents per pound, the phosphoric acid and potash in a ton of fresh horse-fæces would be worth 70 cents. We have shown that the nitrogen (at 10 cents per pound) in one ton of fresh horse-fæces is worth 88 cents, and if we call the other ingredients of the ashes worth 18 cents (a rather high value), it follows that in burning manure we destroy half its value.

From these facts it may be seen whether it will be likely to pay him to burn the manure, and apply the ashes. In regard to the question how the lost nitrogen can be restored, we do not know the price of fertilizers or fertilizing material in California. Nitrate of soda is largely imported into San Francisco for chemical purposes and for making blasting powder. It contains 16 per cent of nitrogen. If it can be obtained for $50 per ton, the cost of nitrogen would be nearly 16 cents per pound. If it can be bought for $40 per ton, the cost of nitrogen would be 12½ cents per pound. The nitrogen in nitrate of soda acts at once. It is immediately available, and is all used up the first season. We are probably safer in saying that 30 pounds of nitrogen per acre in nitrate of soda (in connection with the ashes of manure) would do as much good *the first year* as 100 pounds of nitrogen in the horse-droppings. But if all the crop is removed, root and branch, you will get no benefit from the nitrate the second year. If the crop is principally left on the ground in the shape of leaves, grass, roots, or weeds, a large part of the nitrogen will ultimately be recovered. It will be in about the same condition, so far as availability is concerned, as the nitrogen in the manure.

If 25 tons of fresh horse-manure per acre were applied, they would furnish 220 pounds of nitrogen, worth, as we have estimated, $22. If we should put on the ashes of 25 tons and 450 pounds of nitrate of soda, we should be quite likely to get a larger growth of fruit or other crops the first year than if we used the 25 tons of manure, and we could continue to use the nitrate for several years before the ashes were used up. In all probability, however, it would pay him to use some superphosphate with the nitrate.

RESEEDING FOR PERMANENT MEADOWS.

The question was recently raised in the Delaware County, N. Y., Dairymen's Association, at their annual meeting, why meadows run out so soon. The president remarked that they now need frequent plowing and reseeding; though, when the country was new, they remained much longer, yielding good crops annually of clover and timothy. There were present several of the best farmers in the county, and they freely acknowledged the truth of the statement.

One farmer said the land is being robbed of its elements, which produce large crops of grass, and are not returned; consequently, the land is becoming poor, and would produce less and less. Others responded that top-dressing did not keep the meadows good. It was the decided opinion that meadows, as well as pastures, must be plowed, cultivated, and reseeded, to obtain a full growth.

The writer well remembers an experiment in this direction. A meadow on the "Homestead" farm, in the days when the mower was unknown, was made almost perfect, so smooth was it and free from stones. Each year it was given a heavy top-dressing. The sod became very hard and solid. The grass was fine, and a fair crop was obtained, but not near what should have been grown, as it was the most natural grass-land on the farm. This was carried on for years—long enough to demonstrate whether that was the right way to manage the meadow. It was finally broken up, and a crop of corn raised, followed by spring wheat, and then seeded to clover. A finer crop of clover never grew.

Work in a Swamp.—The farmer who has a muck swamp on his farm has a mine of wealth. Every ton of pure swamp muck, that consists of decayed vegetable matter free from sand, is worth from one to three dollars per ton as it lies on the bank after having been dug two or three months and drained. It contains from one and a half to three per cent of nitrogen, inert and insoluble, it is true, but made easily available by judicious treatment. At the price of inert nitrogen in fertilizers that contained in a ton of good muck is worth from two to six dollars, counting the price at ten cents per pound. Thousands of farmers buy nitrogen in fertilizers at nearly double this price, when by making compost of the muck they may get from twenty to sixty pounds of available nitrogen from every ton of it. The winter season is the best time for working in a swamp, making drains, and getting out the muck.

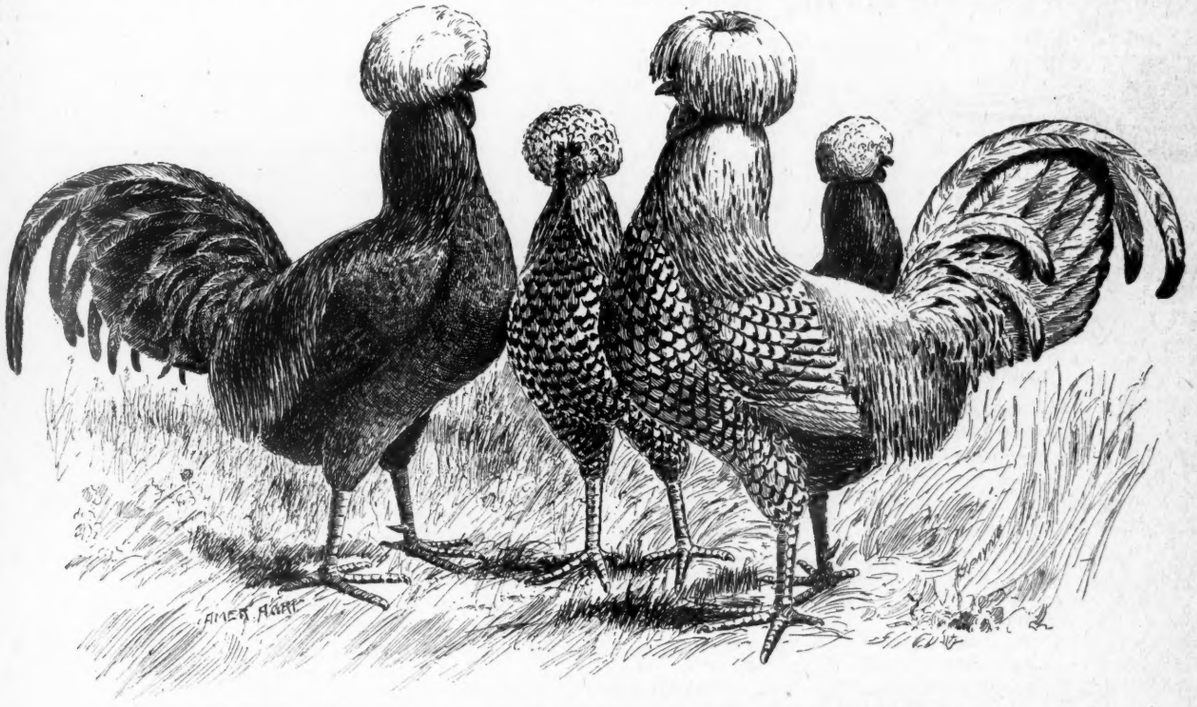
CRESTED POLISH FOWLS.

The various classes of fowls known as Polish are so handsome as to be worthy of keeping for ornamental purposes, and with proper care and treatment are also regular and persistent layers. There are several well-defined breeds of Polish fowls, two pairs of which, the white-crested black and the silver, are illustrated in the accompanying engraving. The other recognized breeds are the bearded golden, bearded silver, bearded white, buff-laced, golden, and the pure white. They vary from one another principally in size, color of plumage, and in the presence or absence of beards. The latter feature is a voluminous tuft of feathers completely enveloping the base of the lower mandible and partly covering the throat. The wattles are nearly obliterated in the bearded. But the distinguishing characteristic of all Polish fowls is the crest, with the bony base upon which it rests. The latter is not a bony excrescence upon the skull, as some writers have asserted, but an attenuation of the cranium itself in a dome-like protuberance, so extensive that a large part of the brain is contained in it. So greatly is the skull attenuated that it is wholly wanting in some parts, leaving a portion of the brain covered only with the membranes. Seated upon this is a nearly globular, showy tuft of feathers. In the black Polish this crest is pure white, with a few black feathers around the lower margin in front. In the silver and golden the feathers of the crest are white or yellow, laced with black. On the cocks the crest should rise well in front, so as not to obstruct the sight. The combs are very small, and cleft or V-shaped at the summit. The wattles of the beardless varieties are thin, pendulous, and bright red. These fowls have plump, handsome forms, and bold, erect carriage. The cocks carry this so far that it gives them an amusingly bumptious appearance. With his towering crest, erect carriage, breast thrown out, and measured march, a Polish cock has the aspect of a miniature drum-major. The hens are very quiet and tame, and will live more contentedly in confinement than any others of the non-sitting classes of fowls. In fact, the large crests restrict the vision to such an extent that the fowls cannot very well see as high as to the top of a fence, and therefore make no effort to fly over. They do not lay in spring until the weather is warm and settled, but when they once begin they are prolific layers, rarely wanting to sit. In fact, a Polish hen is not desirable as a mother, for the overshadowing crest interferes to some extent with her ability to keep a faithful outlook for her brood.

There is a quite common impression that Polish fowls are tender, and difficult to rear and keep. Success with them depends almost wholly upon the kind of shelter and care given. If they have dry, comfortable quarters, and are protected from storms, they are as hardy as any average fowl. They are not specially sensitive to cold, so long as they are kept dry. But in damp situations, exposed to rain and storms, they are peculiarly liable to roup and other fatal diseases. If the crest becomes wet the bird is sure to suffer.

The chicks are beautiful little creatures, the protuberance on the top of the head being quite conspicuous from the moment they leave the shell. It is at first covered with a mass of fluffy down. If a drop of water penetrates this, it is very likely to affect the brain, and, even if the chick live several days, its erratic actions give unmistakable evidence of downright lunacy. It is absolutely necessary to keep them dry and warm. A game-hen makes an admirable mother, vigilant, attentive, and not as liable to crush the tender little chicks as is a heavier Asiatic.

Polish fowls are not to be recommended for general purposes. They cannot endure the neglect and hardship which are the too common lot of barn-yard fowls. But, for one who will give them dry quarters and good care, they are beautiful and useful fowls.



WHITE-CRESTED BLACK AND SILVER POLISH FOWLS.

CHANGING FROM BOX-HIVES TO FRAMES.

A. H. DUFF, KANSAS.

There are even yet farmers who keep their bees in the old box-hives, and give them little or no attention. On occasional years they produce some honey, but as a general thing the owners do not get much. Even in this, it shows that if bees will produce something without attention, they may be made profitable by proper management. Changing bees from box-hives to frames, introducing new stock, and all such operations, are considered by many very difficult. But a person who has once done any of these things feels surprised to find it so easy. Any one can transfer bees. There is no call for a specialist; the first hive of bees that the writer ever saw transferred was the one he did himself, and his first day's work was fifteen colonies. It is only necessary, after having the frame hives ready, to smoke the bees until they fill themselves with honey, which they will always do when smoked. A bee-smoker is indispensable, as there is no other method by which we can so well apply the smoke, and it is an important part of the work. The smoke should be applied at intervals, for some ten minutes, before beginning to make the transfer. Bees, when filled with honey, will make no attempt to sting. When a box-hive is to be transferred, turn it bottom up; draw the nails and pry off two sides, after carefully severing the brace combs from them. The combs are thus laid bare, when, with a thin-bladed, sharp knife, they may be cut out and made to fit in the frames, where they may be fastened by either wrapping with twine round the frame or strips of wood tacked at each side. The frames may be prepared in advance by tacking

strips of wood on one side, and when the combs are laid in the frame the strips may be added to the other side. The fastenings are readily made with a fine buzz-saw. They should be one-fourth of an inch wide, and about three-sixteenths of an inch thick, and one-half inch longer than the width of the frame, to allow of their being tied across the ends, where the comb will not allow of tacks being used; or they may thus be fastened at the ends without the use of tacks.

In cutting out the combs, it is important to save all containing brood. In placing the frames in the new hive have the brood-combs in the center. All drone-comb should be kept out, to suppress the over-production of drones.

It is not advisable to use very old, black combs, but the best only, and procure foundation-comb to fill out the empty space. The fastenings may be all removed in two or three days thereafter, as the bees will fasten up the combs, so that they will not need any support. After the transfer is completed place the new hive in the same place that the old one formerly occupied, and dislodge the bees from the old box. They will eventually go to the new hive.

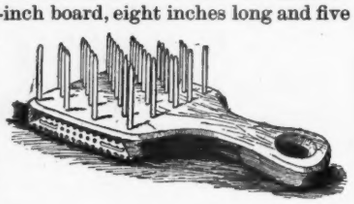
HAND GARDEN ROLLER.

The accompanying illustration of a hand garden roller is from a sketch sent by a subscriber, who says he finds frequent use for it in the garden. Some seeds are simply scattered over the bed and then with the roller pressed into the ground. They germinate better than when covered with the rake. The roller is used for compacting the ground above other seeds and between rows of vegetables. If the earth is ridged up against the vegetables the roller can be run over the ridge, on each side. A piece of log, twenty inches long, is dressed down until ten inches in diameter. Iron pins are driven in the center of each end, the pins working in the iron pieces, which unite to form a prong driven into the end of the handle. This roller can be made at home, except the iron pieces.

HAND GARDEN ROLLER.

A HOME-MADE MANE COMB.

The comb for the mane and tail of horses shown in the illustration is made of a piece of half-inch board, eight inches long and five wide, with one end reduced to the form of a handle, as shown in the engraving. A hole is bored in the end to hang it by. Seven rows of holes are pierced with a brad-awl, four of the rows with five holes each, and the three intermediate rows with four holes, so that the whole shall be in the "quincunx" form. Stout wire nails driven through the holes serve as teeth. The whole is finished by nailing a covering of perforated tin plate on the back, to hold the teeth in place.



MANE COMB.

GATE ATTACHMENT.

Who that has had occasion to drive through a farm-gate when alone has not had a vexatious hunt for a stick of some sort, to use as a prop to hold the gate open against wind or gravity? The illustration shows a device which avoids such hunt. A prop is fastened to the gate with a ring and staple. When the gate is opened as far as necessary, it is given a sharp pull, as if to close it; the sharpened lower end of the prop is forced into the ground, and the gate is firmly held. When the gate is to be closed, a push in the other direction loosens the prop, which is carried around — if it will not drag along — until the gate is nearly closed; then it is dropped on the ground and, forcing the gate shut, will raise it somewhat on the prop, taking a part of the weight off the hinges, and preventing the sagging of the gate.

SHORT-STOP FOR GATE.

CHEAP PORTABLE FENCE.

Our illustrations represent a very light, yet effective, portable fence, of which Mr. Frank S. Crouch, Napa county, California, sends us the sketches and description. Each panel (Fig. 1) is made of three-inch boards, four inches wide and sixteen feet long, with three cross-pieces, the same in width and thickness, three feet long.

FIG. 1. PANEL OF PORTABLE FENCE.

One is placed four inches from each end, and one in the middle. The whole is fastened with wire nails, as are the stays or "horses," one of which is represented in Fig. 2. The legs of this are five feet four inches long and three inches wide. The two uprights are three feet long and three inches apart. The horizontal cross-piece is four feet two inches long, and fourteen inches from the ground. Each one of these pieces supports an end of two panels. Each panel contains nineteen square feet of lumber, and each supporting "horse" seven feet. A fence made in this way will turn horses or cattle. For swine and sheep the cross-pieces of the panels are made a foot longer, and a fourth board is added below.

BETTER THAN A SCRAP-BOOK.

R. G. NEWTON, MICHIGAN.

The saving of useful items, recipes, etc., found in the papers, is almost as necessary as taking the papers themselves; but keeping them and putting them into shape for future reference has always been a troublesome problem. Finding just the right book to paste them in; making the paste (which is likely to sour before the work is done); the pasting, ironing down, indexing, etc., all tend to prevent the work being done. Our illustration shows a cheap and convenient method of obviating all these inconveniences. Secure a box of five hundred cheap Manila envelopes, official size, four by nine and a half inches; then assort the boxes of scraps. Put each separate subject in an envelope by itself. For example, take small fruits, using one envelope for strawberries, one for currants, etc., and label each envelope on one end with the name of the contents generally. Below this, if wanted, can be written an itemized list of each scrap enclosed. Then make boxes to hold the envelopes, about four and a half inches wide, ten inches deep and twelve inches long inside, using one for each distinct or separate variety, as "Poultry," "Garden," "Orchard and Small Fruit," "Cooking," "Household," etc. One of these is shown in the engraving. By putting the envelopes into these in alphabetical order, it is but a moment's work to find any desired scrap on any subject, or the place where every scrap belongs when clipped from the paper. This plan is much more convenient than a scrap-book.

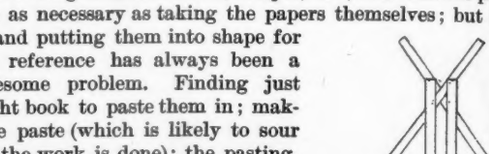
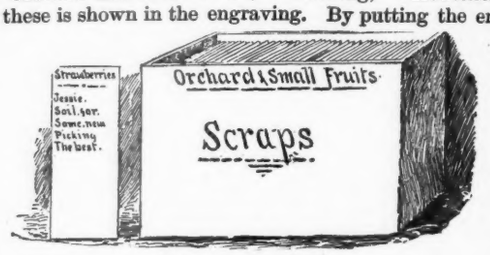


FIG. 2. SUPPORT FOR PANELS.



BOX FOR CLIPPINGS.

FENCES AND FENCING.

When the fields are frozen solid, is a splendid time for hauling out materials for fences.

Do not try to repair a rail-fence by piling rails on top. In this work go to the bottom of things.

When the law requires a man to restrain only his own stock, he does not need half so much fence as when he must fence against everybody else's animals.

PIGS IN CLOVER.

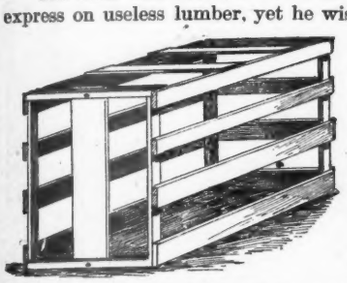
A. H. SHELDON, IOWA.

"No! I never eat pork: the meat is not clean! Hogs are such filthy creatures, you know," remarked an old lady in New England, some years ago. "Yes! But out West they keep their pigs in clover! They have great pastures, covered with grass, and there the hogs grow until autumn, when they are fattened on the new corn, and this keeps them healthy." "Oh! if they eat clover, their meat must be good." Now, this old lady could readily believe that clover must be a valuable element in producing sweet, wholesome pork. But the "West" has no patent on clover for swine. Everywhere its use is perfectly free, and, wherever used, its good effect is quickly noticed. The AMERICAN AGRICULTURIST noticed, some years ago, the case of a gentleman in Southborough, Mass., who sold a few pigs each fall to his neighbors, who had become acquainted with the excellence of his pork, and gradually increased his sales each year, until his grass-fed pigs were in such demand that he had to buy many car-loads annually from farmers who raised the "pigs in clover" as he did on his own farm.

But it is not always practicable to enclose large pastures for swine; so the next best thing is to adopt a system of soiling which will supply the stock with green food in summer, and roots and clover-hay or silage in winter. Hogs can subsist for months under a hay-stack, with a very little grain. A ration of hay or dried grass, during the season when the pastures are covered with snow, will be very acceptable, and greatly reduce the cost of wintering the herd. Clover-seed should be sown very early in spring, as the seed needs to be well covered up before it will germinate. The spring rains wash the seed into the soil, and a "good catch" is reasonably certain; while, if the sowing is delayed until late, the crop is not half as sure.

CRATE FOR SHIPPING PIGS.

The man who receives stock in crates does not care to pay express on useless lumber, yet he wishes to have the crate strong enough to hold his purchase safely until it reaches his farm. Some woods, like poplar, basswood, and elm, are both light and tough, and can be used thinner than pine, but, if pine is thoroughly dried and planed on both sides, a neat, light crate can be made which will hold pigs or sheep securely. A crate for a two-hundred-pound pig must be four feet long, thirteen or fourteen inches wide, and from twenty-four to twenty-eight inches high.



SHIPPING CRATE FOR PEAS.

When sent by freight it should have a feeding-box in front, and be nailed together with wire nails properly clinched. A six-inch board may form the lowest strip of each side, then a four-inch, then two three-inch strips. The sides are nailed up, then the bottom board is sawed out of a proper length to admit the strips at the front, and back of the sides, and securely nailed to the lowest boards of the sides.

The slats are nailed across the front and top, four for each place, then a single board slipped in between two strips at the back end, making a door for getting the pig in and out. Two wire nails hold this board in place. The weight is from thirty-five to forty-five pounds, and will hold a large pig, going hundreds of miles.

Raising Pork.—There are a few things our farmers seem to forget in the raising of pork. One thing is that slop and dirty dish-water are not good enough for hogs. Another is that corn should never be the sole diet. If pigs were fed more upon milk, clover, and grasses, instead of the ordinary swill compound, there would be less danger of sickness and much better pork. Again, if they were allowed the range of fields, and always supplied with fresh water, there would be more health. And last, but most important, comes the housing. What wretched hovels some hogs have! Leaky roofs and wide cracks in the side. Some people keep their swine in old hogsheads, or perhaps large store-boxes. The pen owned by the writer is six feet long and four wide. This is for one hog only. The whole building, roof and sides, is covered with heavy roofing and lining papers, and however hard it is raining, or how deep the snow is, the pen is always dry and warm. It is a great satisfaction to know that animals are always comfortable; and, with good feed, hogs will thrive right along.

COMBINED PIGGERY AND CORN-CRIB.

We give herewith a perspective view and plan of a small piggery, with corn-crib attached. The structure, Fig. 1, is fifteen by twenty-one feet in size, twelve feet high in front, sloping to six feet in the rear. The sides may be covered by vertical boarding, as in the engraving, or, if preferred, by horizontal siding. The siding of the end used as a corn-crib is of narrow boards with interstices an inch or so in width to permit free ventilation. The whole is covered with a good light roof of shingles, or other material.

The ground-plan is shown in Fig. 2. It provides for two wholly distinct sets of apartments. The middle section contains the nests,

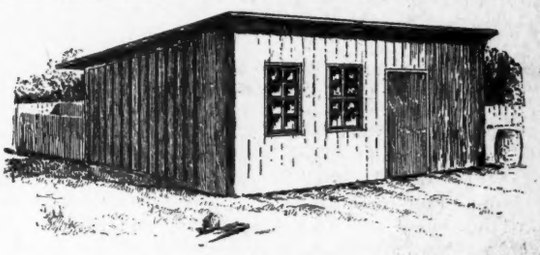


FIG. 1. PERSPECTIVE VIEW OF PIGGERY.

separated by a partition, containing a door by opening which the entire structure may be thrown into communication. Each end has a feeding-pen, with trough projecting into the alley far enough to obviate the necessity of lifting the swill over the side of the pen. The rear portion of each compartment is separated by a partition only six inches high. By this means, the feed-pen is kept duly clean. The two doors opening into the yards in the rear are hung at the bottom, and can be let down so that the tops rest in the yard. Each one thus becomes a platform connecting the pen with the yard. The inside of each may be furnished with transverse slats, if desired. In the rear of each yard is a gate, giving ingress and egress. The entire arrangement is snug, cheap, and convenient.

PIGS FOR PROFIT.

COL. F. D. CURTIS.

There was a time when farmers, some of them, could possibly afford to rear pigs for pictures of fancy. That day has gone by. This kind of sentiment went out suddenly, with me, one day, when butchering time came, and I found that it took two and one-half of dressed and fancy pigs to weigh as much as one dressed pig born and reared for utility. They were all of about the same age, and had had the same chance for pasture, apples, and other food. The pigs with the long bodies were natural foragers. They took kindly to apples. They ate grass when very young, and they kept at it. This was, to them, food—as it is to the cow or the steer.

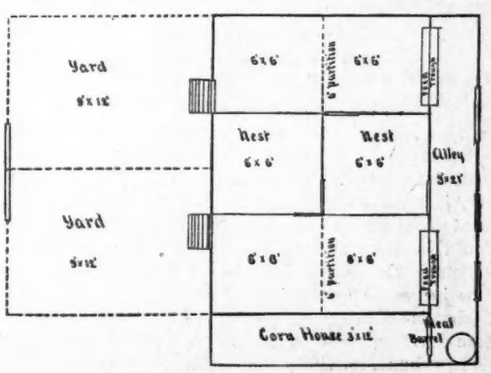


FIG. 2. PLAN OF PIGGERY.

They converted it into meat. They had the jaws to grasp the grass, long or short, and the jaws to eat—masticate it. Jaws, then, are worth something to a pig. They are tools to work with. A stub nose and a dished jaw are fitted for doing nothing. Such a hog, thus adorned with the extremity a fanciful civilization has put on him, is made necessarily a helpless ornament to the farm. Of

course, if one has a taste that way and can afford it, it is all right; but I have a text with another meaning. There is not so much money in the trough as there used to be. Our pig money must now come more out of the pasture, the clover, the orchard, and other cheaper foods. Money can be made out of pigs and pasture, with middlings, and the corn from the starch-mills. We must grow pigs for meat. The chunky pigs do not thus abound. The long-bodied pigs are the ones we want for pork to cut up for fresh meat, and also for salting. They will have the most lean meat. They are the best to produce numbers of pigs and sustenance. Their young are larger at birth and more active. The start at birth, with more size and more milk, was one of the reasons why one of my utility pigs was equal at slaughter to two and a half of the fancy ones. Look at the profit—two and a half lives to be supported as against one. The coming demand is not for pork in the lard sense, but meat in the muscle sense. An active hog will naturally make more muscle and make it faster than an inactive or sluggish one. The sluggish one will fill up with fat, if fed enough. The active pig is more healthy, and its meat is better. It will have a better flavor. Sluggishness dries up the secretions and thickens the blood. Any farmer who has a tolerable orchard should seed it with orchard grass, and stock it with hogs. Keep a few breeding sows, with long bodies and medium bone, and cross them with sires as good as they are. There will be no trouble about the pigs maturing. This word means nothing, as it is generally used, but fat. The pigs of the kind of hogs I name will grow, and grow fast. Growth is what we want, and when the growth has reached a point fitted for market of sufficient weight, either fifty, seventy-five, or one hundred pounds, then put the pigs into the market and have more coming on to fill their places. This can be easily done by feeding the pigs in side pens, or enclosures by themselves. When thus managed, the sows can be taken from the field—and the pigs will hardly miss them—and be bred again. It does not pay to try to feed pigs through their mothers after they are six weeks old. They will do better to have all the extra food by themselves. The sows in this way can be made to have two litters each year, and the later ones can be sold for roasters, when they will dress about fifteen pounds. It is a mistake to use a small dam for a breeder, or one of a small breed, and it is about as much of a mistake to use a sire of a small breed. There has been quite an idea of using pure-bred hogs of the smaller breeds for sires on the ground that the off-spring would mature quicker. This is a mistake. If we want meat and weight soonest, use the sires of any medium-sized breed, rather than of the small breeds. It is cheaper to make growth than it is to make fat. Fat is the costliest part of an animal, and of the least value as a food. We have become used to the sight of helpless hogs for our pork. Custom has made this idea; but it is erroneous, nevertheless. The pig well filled out all around, with muscles well and largely developed, rounded and smooth, and still active, is a better pig to be served upon the table than one helpless, stuffed, and feverish with fat. The butcher who has the hog fatted lean will always want more, and so will the customer. The line of grain-feeding should be middlings, rye, or wheat, for a single food; oats also; barley and bran, or, for a change, corn and bran, with twice more bran than barley, or corn and linseed meal for a regulator and as daily food.

THE WASTES OF THE FARM.

JASPER N. DAVIDSON, INDIANA.

The first comment of Eastern farmers who visit the Western States concerns the prodigal waste manifest in every branch of agricultural industry. The extent of the fault is perhaps over-rated, but it is patent to observers that the small things and minor sources of profit on the farm are allowed to go to waste. Our acreage would be increased if we had fewer "lots and pens," the fences around which should be limited to actual needs. Our yields might be increased by a study of soils and the use of fertilizers, and of what is actually produced there is a great waste.

Some farmers, with a view of "hardening" their live-stock, allow it to exhaust its vitality in battling with the elements. To say nothing of the cruelty of this course, these men sustain a loss which is never regained. They buy expensive machinery and tools, yet are constantly needing more. Their implements stand in field and furrow from season to season, and are soon worn out. Stacks of hay and grain are left unsecured while the weather is favorable, and, sooner or later, disasters befall them, which seriously curtail the owner's resources. The lack of a sound roof involves loss by must and mold, besides the damage to the building. Faulty fastenings and hinges to gates and doors are neglected for months, when a few moments' work with hammer and nails would make all safe and secure. Cribs and bins become the resorts of rats, which rapidly eat up the profits. Vehicles remain coated with mud, which removes the protecting paint. Feeding-racks for stock are badly constructed, and much is wasted. Dead branches are allowed to remain on trees, harboring worms and insects. Culverts and bridges are overlooked until a serious accident occurs. Old iron accumulates until it becomes a nuisance. Bad fences expose crops to ruin, and stock to foundering. Ashes are dumped in piles—at once unsightly and unwholesome—instead of being put to practical use. Liquid gold from the barn-yard manure-heaps runs to the nearest stream with every rain. Poultry houses are neglected, entailing loss from diseased fowls and from wasted fertilizers. Where tile-drainage is common, the outlets are neglected, in dry seasons, until sudden and continued rains cause overflowing of the crops. Some carelessness, and a little selfishness, as to line-gates and fences, foster lawsuits and family feuds, which may last for generations.

Very many of these matters seem trivial; yet, if measured by dollars and cents, would be surprising. "Send me a man who will look after details, and I will risk the remainder," was the expression of a successful man, in search of an employé. The proverbial "stitch in time" applies as pertinently to the "little things" on the farm as to the needle of the helpmate.

PROTECTION FROM CANKER-WORMS.

DR. GEORGE THURBER.

The canker-worm, forty or fifty years ago, in the New England and other of the older States, so completely defoliated the orchards and shade-trees, that they were left bare and brown as if a fire had passed over them. By a study of the insect's habits the best treatment was learned, and for many years only few canker-worms were seen. But in Western New York, Ohio, and further west they have become as destructive as they formerly were near the seaboard. The caterpillars, after they have made their growth, enter the ground to pupate and then turn to moths, in which perfect state they come in early spring and ascend the tree to lay their eggs upon the trunks. As soon as young leaves appear, the caterpillars will hatch out. The male, like most other moths, flies to the head of the tree, but the female moth is without wings, and therefore can reach the branches to deposit her eggs only by crawling up. All the methods for protecting the trees against this insect have reference to stopping the wingless female moth from crawling up the tree. Some of the contrivances for accomplishing this show much ingenuity and are expensive. In most such matters the simplest and cheapest are the most effective. The best precaution is a band of stiff brown paper encircling the trunk. In the middle of each strip of paper a band of tar is smeared, which, as long as it remains viscid, arrests the upward progress of the insect. The moth may sometimes manage to crawl up between the paper and the bark. This may be prevented by placing a layer of cotton batting inside of the paper band. Instead of tar, refuse printers' ink is preferred as being more lasting. In any case, the bands must be inspected frequently and the viscid material renewed. Dust, small fragments of leaves, and other light material, may be carried by the wind and adhere to the bands in sufficient quantities to form a bridge over which the wingless female may pass. Sometimes the moths themselves, in their attempts to force a passage up, are caught in such numbers that the bodies of the foremost ones form a bridge over which the more fortunate followers may cross. The necessity for renewing the viscid surface will be evident.

Another contrivance is to make a band of sheet-tin about four inches wide and considerably larger than the trunk of the tree. This is attached by its upper edge to a broad strip of muslin, which, by means of a gathering string, is made fast around the tree, leaving the tin band suspended about four inches from the tree on all sides. The inner surface of the tin is smeared with a mixture of castor-oil and kerosene in equal parts. The insect cannot ascend the tree without trying to pass this barrier, and in so doing it comes in contact with the kerosene on the tin, and is killed or disabled.

Protect Your Poultry.—Wash the roosts occasionally with kerosene or crude oil. This prevents the accumulation of lice in the poultry-houses, and the fumes of this pungent oil penetrate into every crack and permeate the feathers of the fowls at night, thus protecting them, to a great extent, from the ravages of their insect enemies.

AMERICAN MERINO SHEEP.

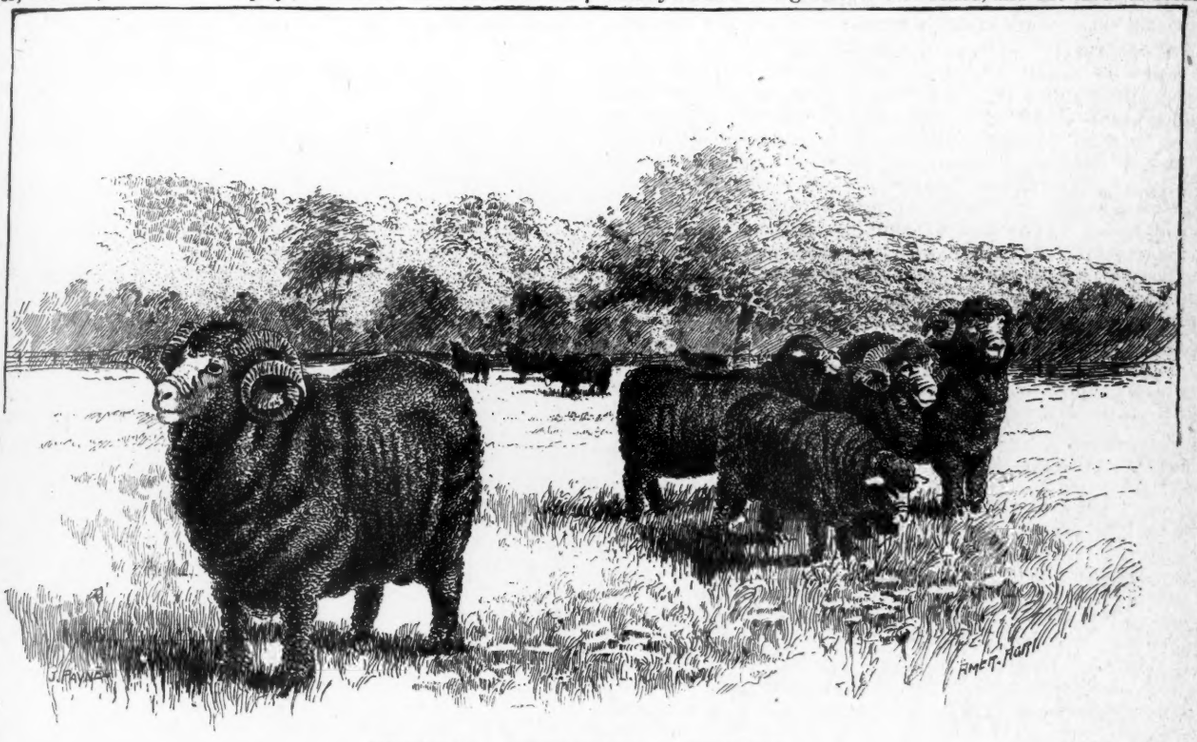
The history of Merino sheep in the United States is one of singular vicissitudes. The first Spanish Merinos brought to this country, at great cost and risk, by Mr. William Foster, of Boston, were presented by him to a friend, who, so far from appreciating the potential value of the importation, had them slaughtered and ate the mutton. The same friend afterwards paid a thousand dollars for a Merino ram. Subsequent importations have met more appreciative receptions. They and their progeny have added millions of dollars to the wealth of the country. But instead of keeping steadily along with the growth of the country, the Merino sheep interest has been subject to frequent and violent fluctuations. A "boom" with extravagant prices has been followed by a season of depression, with wholesale slaughter of the flocks.

But, through all these fluctuating experiences, the American Merino sheep have continued to improve in quality, and have for years received recognition in various parts of the world, as the highest type of fine-wooled sheep. The small, thin, leggy Merino, covered with a light kempy fleece, which was first brought to this country, has been succeeded by a compact, short-legged animal with a fleece of unsurpassed excellence. The carcass has become larger, heavier, and more shapely; the fleece has increased in weight, and improved in quality. Of the first importations the unwashed fleece averaged about eight pounds for rams, and five pounds for ewes. The sheep were without wrinkles, the legs below the knees and hocks bare of wool, and very little of it on the heads and lower parts of the body. From those bare-legged, bald, light-fleeced sheep has been bred up the well-covered American Merino, producing a fine fleece which will weigh, unwashed, twenty to thirty pounds from the ram, and twelve to fifteen pounds from the ewe. A comparison of the accompanying engraving of a flock of Vermont Merinoes with portraits of the pioneer sheep illustrates the great advance which has been made in these sheep.

In Australia, and other wool-growing regions, American Merinoes have, for many years, commanded the highest prices and quickest sales.

In the United States, the center of the wool-growing industry has shifted to the west of the Mississippi. As the flocks have disappeared, or been replaced by those of the heavier "mutton" breeds in the Eastern and Middle States, the fine-wool industry has attained great magnitude in the region west of the one-hundredth meridian. The introduction and care of sheep in those wild, unsettled regions were attended with many perils and hardships. As an Arizona sheep-rancher once remarked to the writer, "It cost a great deal for lead and strychnine to defend the sheep from Indians and coyotes." But the flocks are now well established, and sheep ranching is a fairly profitable pursuit.

In the older States, where wool-growing has largely declined, there are still many fine flocks in the hands of skillful, enterprising breeders. From these flocks is drawn the foundation stock which is carried to the West and all over the world.



TYPICAL VERMONT MERINOS.

THE HEMP CROP IN KENTUCKY.

JAMES K. REEVE.

The cultivation of hemp is an industry of special importance in the blue-grass district of Kentucky. The soil and climate seem to be as favorable for this product as it is for the growing of fast horses.

Ground for hemp is plowed as early in the spring as circumstances will permit, and made ready for seeding by the latter part of April, or the 1st of May. After plowing and harrowing, the ground is dragged with a leveler, made of planks, which leaves the surface firm and smooth. The seed is then sown, at the rate of one bushel per acre, with a grain-drill from which the hoes have been removed, and a "scatterboard" attachment put in their place. Thus the seed is practically broadcasted, but with an even distribution not attainable by hand. The ground is then rolled, and the labor of seeding and cultivating is at once concluded. The crop then demands no further attention until it ripens in August. The time at which to begin harvesting is indicated by the leaves turning yellow and falling off. The first operation of the harvest consists in cutting the canes. This is done almost wholly by hand, the canes being cut with a sickle close to the ground, then gathered into bundles convenient for handling, and tied. They are then stacked, care being taken to build the stack so that it will shed water perfectly. If water penetrates and freezes in the stack, it makes the subsequent handling very difficult, and sometimes retards the work seriously.

Early in the winter, during November and the first part of December, the stacks are taken down, the bundles placed upon sleds, and drawn to different portions of the field, then opened and the canes spread upon the ground in an even single layer. Here they are left until sufficiently retted to "break," the length of time depending somewhat upon the weather. The cane will also ret sooner upon plowed ground than upon sod.

It is a sure indication of a good crop when it is found that it cannot all be spread upon the ground where grown. When retted sufficiently to handle, which is usually in a month or six weeks, the cane is again gathered into bundles and set up in small shocks at convenient distances. The "breaking," which is the operation of

separating the pith of the stalk from the fiber, is the most laborious and expensive process connected with the growth and preparation of the hemp crop. Handfuls of canes are laid across a wooden frame, and beaten rapidly and continuously with a heavy, movable lever, one end of which is fixed in the frame. The canes are moved to and fro upon the frame until every portion has been well broken, when the stalk is shaken out from the fiber, which is then knotted into a "hand," and these made into bales of one hundred weight each. Hemp is an expensive crop to handle, requires considerable capital per acre, and is on hand almost a full year from the time of breaking ground until ready for market.

Cutting is done by the acre, at the uniform price of three dollars. Some attempts have been made to cut by machinery, but that method is not in favor, because it leaves a higher stubble than when cut by hand, and, as the heaviest growth of fiber is upon the large butt of the cane, this loss materially decreases the yield. Another difficulty is that the canes are so tall (often from ten to fifteen feet) that they fall over upon the machine and interfere with its operation.

Breaking is usually done by the negroes, and is paid for at one dollar per one hundred pounds. Some attempts have also been made to do this by machinery, but never with any degree of success. Experiments have also been made to break the cane without retting. It has been demonstrated that the fiber is then much stronger, having nearly twice the tensile strength that it has after being retted. A difficulty encountered in this attempt has been that no practical method has been devised for curing the fiber, if taken from the cane as soon as ripe. It would seem that our inventors might find a remunerative field here for their genius. A peculiarity in marketing hemp is, that it is sold by the hundred weight. If the price is said to be five cents, it means five dollars for one hundred and twelve pounds. In breaking, however, every pound of the hundred weight must be paid for at one cent per pound.

While a good crop of hemp can only be grown on rich land, it is not a crop that exhausts the soil rapidly, and so may be grown for successive years. A fair crop in the blue-grass region is one thousand pounds per acre; it will run all the way from six hundred to sixteen hundred pounds. Five cents is now considered a fair price, but in recent years has ranged from four to eight cents. The average cost of production is not far from twenty-five dollars per acre.

As it does not require a long season for growth, there seems to be no good reason why it should not be more generally cultivated over an extended territory than it now is.

EARLY PLANTS FOR EVERYBODY.

Those who follow market gardening on a large scale get their plants for their earliest crops of cabbages, cauliflowers, and lettuce by sowing the seeds in the fall, and, when the plants have acquired a proper size, to check their growth by transplanting them to cold-frames. These are simply board boxes or frames, covered with sash; just like a hot-bed, but without manure or other heating material. Their growth being thus checked, the plants are to be kept in a dormant state until they are planted out in the garden, in early spring. Sometimes it requires great attention to carry the plants through the winter and earliest weeks of spring, on account of sudden warm spells, which start the plants into activity and growth; then, if cold weather comes, the plants may be killed, and all the labor and care bestowed on them be lost. Then, the care and risk are so great that it is much cheaper for those who require but few plants to purchase them than to raise them. Those who need but few plants for the earlier crop of cabbage, etc., can raise them, with very little trouble, in their own kitchen. For the best results, the soil should be prepared by sifting, to remove stones and rubbish, adding fertilizer, sand, leaf-mold, or whatever will improve its quality. An excellent material to mix with soil is dried and fine moss. This can be had at any time, if one will take the trouble, as it is used in packing by nurserymen and others, and it is an article offered for sale. This is known as peat-moss, swamp-moss, or sphagnum. For mixing with soil, it must be thoroughly dried, by placing it, in a box or basket, in a warm place in the kitchen, or, if in a hurry, it can be dried, a little at a time, in the oven of the stove, with the doors open; a slight scorching will not injure the moss for this use, should it occur in the hurry of drying. When quite dry, rub the moss through a coarse sieve, and reduce it to powder. The earth should then be mixed with the fine moss, one-fourth as much, more or less, of moss as you have of soil. Sift the soil and moss together, in order to thoroughly mix them. The boxes should be as long as the width of the window, a foot wide, and three inches in depth. If the sills are too narrow for the boxes to rest on them without support, this may be afforded by inserting a screw at each end, about an inch from the top, on the outermost corners. A piece of copper wire is twisted around the screw in the box, and its other end around a screw in the window-frame, a foot or more higher than the box. The boxes are advised for use in the kitchen, but, with proper care, they may be set in any other room. The kitchen is the most suitable, as the atmosphere is moist from the cooking, washing, and other operations, and more favorable for plants than the usually dry atmosphere of our dwellings. The mixed soil and moss having laid in a heap for a few days, the boxes should be filled to within a short distance of the top. The seeds are to be sown in lines, crosswise of the box, and about two inches apart. Make these lines with a straight-edge or ruler, using a small stick to draw them. In the slight furrows thus made, drop the seeds—small seeds about four to the inch of furrow—and cover them by sifting over fine moss to about a fourth-inch deep. Give a good watering with blood-warm water, from a fine hose, and thereafter give water as needed. Look to the boxes daily, to see the condition as to moisture. As the plants grow, weeding, thinning, and transplanting to other boxes must be given, as with seedlings grown elsewhere.

PREPARING SOD GROUND FOR CORN.

JOHN M. STAHL, ILLINOIS.

Leaving out of consideration the question of plowing sod in the fall, if it is plowed in the spring, it is best done as soon as the ground is in good condition. Sod ground can be plowed earlier than fallow, stubble or corn-stalk ground, and the sod will have none too long to partially decompose before the corn is planted.

A good plow for stubble or fallow land is one that moves the furrow-slice with considerable force, breaking it up; but such a plow is not a fit one for sod ground, for it will leave parts of the furrow-slice lying with the grass up, and other parts standing on edge. The harrow will then leave many pieces with the grass up, to grow again. The best plow for sod is one that turns the furrow slice completely upside down, and no more, without breaking it. Then the plowed ground can be fined without bringing grass to the surface to grow again.

For the first work on the plowed ground, the Acme, Cutaway, or a disk harrow is the best. With one of these harrows the ground can be better cut up, and with much less labor of man and beast, than with the straight-tooth harrow; and on sod ground the smoothing-harrow is used only to put on the finishing touches just before the corn is planted.

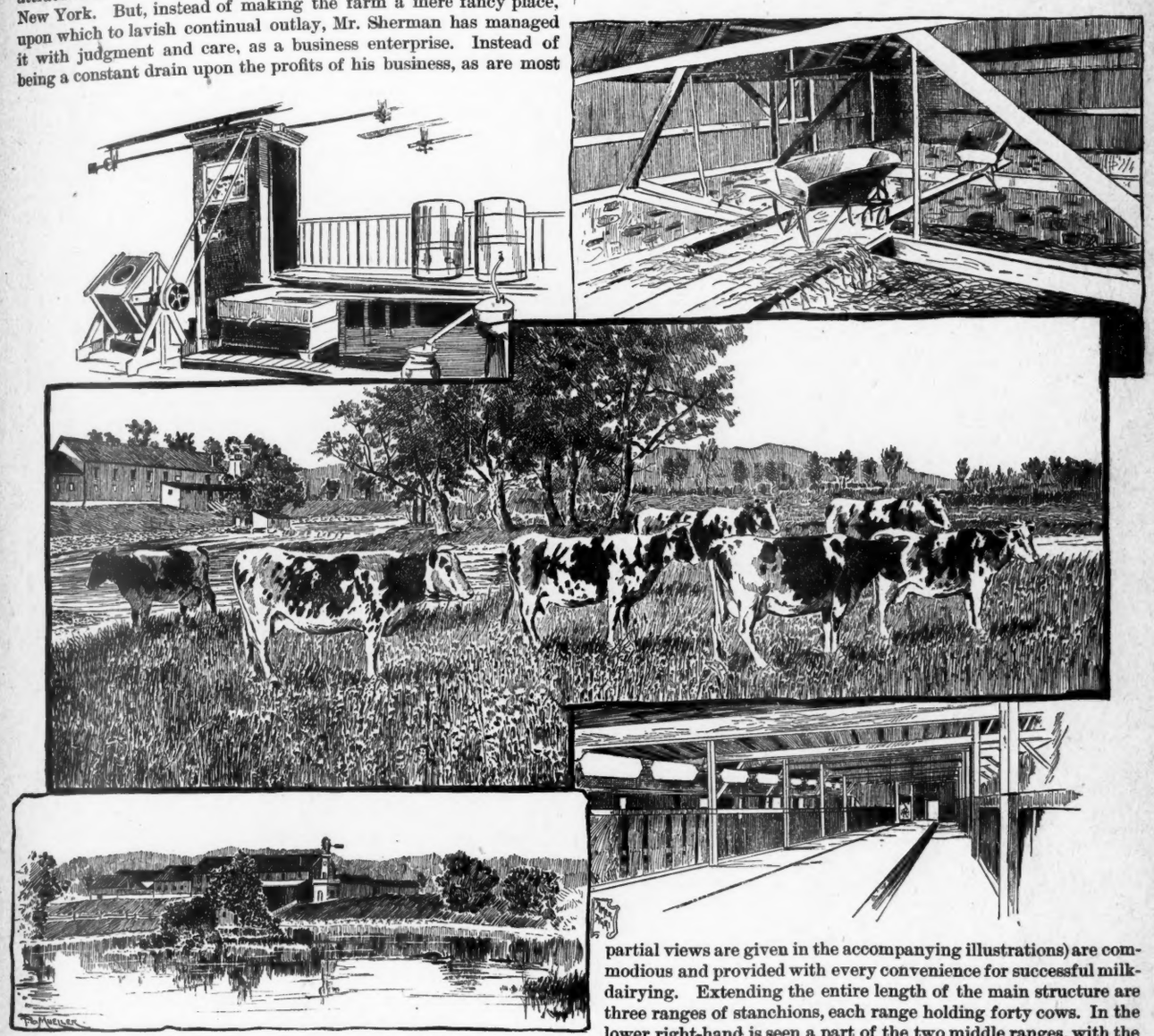
Sod requires more work than stubble to put in good condition for the seed, and the loss from planting on sod not well prepared is greater than on stubble. Unless the ground is thoroughly worked, there will be crevices among and beneath the sods, which will aggravate the effects of both drouth and flood. The pieces of sod will constantly interfere with cultivation, and if one of these pieces is beneath a hill the corn will likely be torn up by the cultivator. Neither will the sod be so well decomposed and feed the crop.

Another reason for careful preparation of the sod is that it is often infested with cutworms and other worms. The more the ground is stirred, the more of these will be destroyed; and planting may safely be deferred until the cutworms have passed their voracious period, and will do little damage. Quite frequently sod ground, and especially clover-sod ground, contains so many cutworms that it is not advisable to plant it until quite late. Only a poor stand will remain. Last spring I allowed a forty-acre clover-sod field to lie a month after it was almost ready for the planter. One of my employees became very impatient, and thought I was wrong not to plant at once, as some of my neighbors had done. But much of their corn was cut off by the worms, and they had only a poor stand, with some hills a month behind the others. When I planted I had a most excellent stand and the field averaged eighty bushels, shelled, per acre. On sod ground thoroughly prepared corn grows so fast that it is safe to defer planting until quite late, and this ground is not so apt to be hardened by rains as is other ground.

Ornaments of the Door-Yards.—Nothing is more attractive around a farm-house than a flock of evenly-marked and handsomely-plumaged fowls. They are an ornament to the door-yard, and of interest and profit to the owner, while a flock of mongrels have no beauty. If the boys and girls are allowed a small flock of fine birds, as their own, to care for and manage, you will find they will make them pay. Just try it and be convinced.

A PROFITABLE DAIRY FARM.

Lying in the beautiful Harlem Valley, about seventy-five miles north of New York city, and in the near vicinity of Dover Plains, N. Y., is Maybrook Stock-Farm. This is, and for a dozen years has been, the summer home of Mr. D. H. Sherman, vice-president and manager of the Jersey City Stock-yard Company. He is widely known in business circles as an energetic and successful business man. When he acquired this rural home, not far from his birthplace, it was in very primitive condition. Years of steady improvement, guided by skill and good taste, have made it one of the most attractive of the many fine country homes of the opulent citizens of New York. But, instead of making the farm a mere fancy place, upon which to lavish continual outlay, Mr. Sherman has managed it with judgment and care, as a business enterprise. Instead of being a constant drain upon the profits of his business, as are most



GLIMPSES OF MAYBROOK.

country homes of wealthy men, it has been made to earn as good a yearly per cent of profit as any other investment of its successful owner.

The farm contained about six hundred acres, but Mr. Sherman has recently sold off an outlying portion, leaving a compact body of something over four hundred acres. About thirty acres are occupied by the mansion, with the surrounding lawn, orchard, gardens, and stables. In the rear is a fine growth of maples and other timber, clear to the summit of a low range of hills. May brook—peopled with speckled trout—has its birth in numerous springs, and dashes over its pebbly bed directly through the grounds, and very near the mansion. In all the appointments of the home, there is no vulgar display or ostentation, but on every side the evidences of refined taste. The house and all the buildings are painted in subdued shades of terra cotta, which harmonize well with the verdant surroundings. A chapter might be written describing the house and grounds—the luxurious billiard pavilion; the numerous sparkling fountains; the borders and greenhouses; but it would be foreign to the purpose of this article.

A little northeasterly of the house is a singular kettle-shaped elevation, which must have been upheaved in some great convulsion of nature. The roadway to the cow-barns winds around its base, and its summit is crowned with a pagoda-like structure, which contains an iron water-tank having a capacity of 100,000 gallons. It is a picturesque landmark, visible for miles up and down the valley. The water is pumped into this from the brook, and pipes leading from it furnish an abundant supply. The barns (of which partial views are given in the accompanying illustrations) are commodious and provided with every convenience for successful milk-dairying. Extending the entire length of the main structure are three ranges of stanchions, each range holding forty cows. In the lower right-hand is seen a part of the two middle ranges, with the slightly sloping platform upon which the cows stand. The gutter catches all the droppings, solid and liquid. On the other side of the stanchions are feed-troughs and iron water-troughs, which are kept full by a pipe extending along the bottom of the feed-trough. The supply is regulated by a ball-valve. This is shut off at frequent intervals and the water drawn off, to prevent stagnation. Directly above the stanchions extends an iron shaft, to which, in summer, are attached the revolving canvas fans seen in the engraving. These are kept in motion in hot weather, driving away flies and maintaining perfect ventilation. The gutters are cleaned out and flushed every day, and the floors are sprinkled with ground plaster, which absorbs all unpleasant odors. The manure is wheeled out to the manure-house (of which the interior is seen in the upper right-hand of our illustration) and deposited in cement-lined pits.

Immediately south of the barn, and a little below it, flows the Weebotuck river, across which Mr. Sherman has built a dam (shown

near left of the central view herewith). A turbine, in the small wheel-house seen at the further end of the dam, furnishes all the power needed for pumping water, thrashing and grinding grain, cutting fodder, sawing wood, operating the creamery machinery and stable-fans, and elevating hay to the lofts. In one of the barns are twenty roomy box-stalls, for the use of cows during parturition or in sickness.

Nothing is sold off the farm but milk, the product being taken by Borden's condensing factory, at Wassaic, three miles north of the farm. The milk of each cow is weighed and its weight recorded; it is then strained into forty-quart cans, which are plunged to the neck in vats of cold water until the temperature is reduced to the proper point. During July and August the factory receives no milk Sundays. To work this up into butter for use on the farm, Mr. Sherman has fitted up, in the second story of the barn, opposite the dam, the creamery shown in the upper left-hand of our engraving. It is supplied with deep-setting vats, a De Laval separator, power-churn, and butter-worker, and a mold which presses the butter into neatly-stamped balls. The elevator seen near the churn communicates with the cold-storage room below, which adjoins an ice-room, with capacity for several hundred tons of ice.

The herd consists wholly of pure-bred, registered Holstein-Friesians. After trying various methods of keeping the farm stocked, Mr. Sherman began, about six years ago, to breed up a pure-bred herd. He purchased foundation stock, not paying fancy prices for fancy pedigrees, but selecting for individual merit. Still, his stock has the blood of the Netherland, Artis, Aaggie, and other fashionable families, and some of his cows have records of more than 16,000 pounds of milk in a year. Carefully selecting and raising the most promising heifer-calves, and turning off the grades as the former came to the pail, he has now a herd of about 120 pure-bred females, of all ages, and several stock bulls of the highest breeding. The cattle are turned to pasture during the summer, with supplementary rations daily. About the first of September they are taken up and fed on green fodder-corn run through the cutter and sprinkled with a mixture of bran and ground oats. This lasts but a few weeks before the autumn frosts, and then comes the regular winter system. As the rules of the milk-condensing factories prohibit the use of silage for cows which supply the milk, the corn is cut up and cured in shocks in the field. This is drawn in and run through a powerful cutter, ears and all. Twelve hours in advance of feeding, the required amount of the cut-feed is pressed into tanks that are on wheels, for convenient moving. It is covered with boiling water, closed tightly, and allowed to soak until wanted, when it is found to be thoroughly softened. It is fed with wheat bran, ground oats, and hominy. Once a day each cow has a feed of uncut hay. An occasional ration of mangel-wurzels is also given. These, as well as the corn, oats, and hay, are raised on the farm.

As may well be supposed, the operations of such a farm require the labor of a good many men and teams. About one man is kept for every ten cows. There are also kept five horses, seven mules, and two yoke of oxen. Mr. Thomas Butts has for several years been the general manager, and has ably carried out Mr. Sherman's ideas of successful management. He has just purchased the outlying portion of the original farm, and begun for himself.

It is not claimed that the profits of the farm alone cover the expenses of living in the style which Mr. Sherman finds himself fortunate enough to afford. But the accounts of the farm are kept entirely distinct from those of the household. It is charged with every item of expense and credited with all it produces. The balance, as remarked before, shows a handsome profit on the investment, even in these times of low prices for all farm products.

A Prize Crop that Paid.—Many farmers, while approving of large crops, believe they are not profitable. But Milton G. Shaver's experience in competing for the AMERICAN AGRICULTURIST oat prize last year, in Cayuga Co., New York, resulted in a yield of sixty-seven bushels per acre by methods which any practical farmer may adopt. A sandy loam soil was chosen that had been treated as is common in that region. It grew corn and potatoes in 1885 with very little manure, was in barley the next year, and was sown with fall wheat after a very light coating of manure, yielding about twenty bushels per acre. The grass seed failing to catch, the land was planted to potatoes in 1888, receiving ten two-horse loads of strawy stable-manure. It was plowed with a two-horse team, and worked for half a day with the spring-tooth harrow. After once harrowing, 150 pounds of phosphate was sown broadcast; it was again harrowed, a bushel of Swedish oats were sown broadcast, followed by the harrow for the third time. Then two bushels more seed was drilled in with 350 pounds of phosphate. Finally, the land was rolled, as this is considered indispensable for all spring crops. Mr. Shaver says: "I am seventy years old, and never saw a handsomer or stouter piece of straw, and but for the wet weather it would have yielded 100 bushels per acre. It weighed thirty-nine pounds per bushel, but no other oats in this region will weigh over thirty pounds per bushel, or yield over thirty bushels per acre." Good seed, good fertilizers, and thorough preparation of the soil did it. Why will farmers persist in sowing common or poor oats on ill-prepared soil when the same effort can be made to produce twice the result?

FEEDING FOR PROFIT.

JOHN J. NEW, INDIANA.

For one who keeps horses for speed or pleasure the main point in selecting food material is quality, cost being secondary. The same is true in a large degree of those who keep fine stock for breeding purposes. But the farmer who is feeding and fattening stock for the market must study economy as well as quality. With him it is a vital question how to keep his animals in thriving condition and fit them for the market at the least cost. To starve or underfeed stock leads to ruin and bankruptcy. If there is more stock than feed, it is far better to sell off the surplus at once and keep only what can be well and sufficiently fed.

A great deal of valuable forage is either allowed to go absolutely to waste, or is fed in a very wasteful manner. First among this is corn fodder. It may be cut up to advantage only where there are appliances for steaming it. For horses the tops and leaves of corn fodder, fed without cutting, are the best coarse forage that can be given. Hay and straw are best cut, wet, and mixed with ground feed. It is good economy to grind all kinds of grain before feeding. I grind corn, cob and all; fine for horses and hogs and coarse for cattle and sheep. Oats, barley, rye, and wheat offal should be ground fine. My way of feeding horses and milch cows is to take two parts of cob-meal to one of oat-meal, wet thoroughly, and mix with fine-cut hay, made slopping wet. I never feed dry food to horses, and wet is much the best for milch cows. Millet is coming into general use. It makes good cattle-feed, but should be fed to horses sparingly, and with care. I am not so much afraid of the danger of founder as of the fuzz on the heads. The cheapest feed for stock-hogs and breeding-sows is ground feed, mixed with clover-hay cut short. Nothing surpasses this in cheapness or health, and a sow fed on this mixture will be likely to have a large flow of milk. It should not be fed to fattening hogs, as it will give the lard a greenish cast. Poultry of all kinds can be given clover, cut fine, and then mixed and cooked with chop.

Fertilizers for Oats.—It is a serious question with many farmers, particularly in the Central West, to what extent fertilizers can be employed at a profit. Jacob Zellers, a contestant in the AMERICAN AGRICULTURIST competition last year, applied 800 pounds of phosphate on his acre of oats and harvested thirty bushels. The land for sixteen years had been in a four-year rotation of oats without manure, then wheat drilled in with grass-seed and 200 pounds per acre of bone meal, after having twelve two-horse loads of manure plowed under, the hay crop being followed the fourth year by corn. The crops were fifteen bushels per acre of oats and wheat, two tons of hay and forty bushels of corn. The practical result is therefore an increase of fifteen bushels in yield by the use of 800 pounds of phosphate. This certainly did not pay, even allowing liberally for the plant-food remaining in the soil. There are evidences in Mr. Zeller's report that lead to the conclusion that very much less fertilizer would have had the same result at a cost that would have proved a profitable investment. It is a simple matter for farmers to find out how much fertilizer it will pay to use by applying varying quantities to strips of land, and noting which plot gives the most profitable crop. In the case of J. C. Miller, Fairfield Co., Ohio, a clay loam that had never been manured—a corn stubble—was stirred three or four inches deep with a spring-tooth cultivator, followed by four harrowings with the Thomas harrow, twice each way alternately, and was rolled twice. Then 400 pounds of phosphate were drilled in, after which two and one-half bushels of White Bonanza oats were drilled in crosswise with 200 pounds of bone-meal. Just before the last harrowing, 100 pounds of salt was broadcasted, and 150 pounds of nitrate of soda was sown by hand five days after planting. At fifty cents, the crop of sixty-nine bushels just about paid for itself.

CULTIVATION OF WHEAT.

BY J. J. WILLIS, SUPERINTENDENT OF SIR J. B. LAWES' EXPERIMENTS, ROTHAMSTED, ENGLAND.

The questions of thick and thin seeding of wheat, and the proper cultivation of the soil during the growth of the crop, have been so frequently discussed, that a few remarks on the subject gathered from the Rothamsted experimental wheat field, which has last year grown its forty-sixth crop of wheat in succession on the same land, may be of value.

Notwithstanding very much labor annually bestowed on hand-hoeing, the experimental wheat field has in recent years, in great part owing to the characters of the seasons, become very foul with weeds. For the crop of the past year, 1889, therefore, down one-half the length of the plats—a distance of about forty-four yards—only alternate rows of wheat were sown, in order as far as possible to eradicate weedy plants. The other half of the field was sown in the usual way. That is to say, upon one-half of the field the rows of wheat were sixteen inches apart, and upon the other half the rows eight inches apart. This method of thin seeding, besides allowing of a free cleaning of the soil, is well fitted to develop in the highest degree the healthy distribution of both the under-ground and above-ground feeders of the plant. And we find the wheat has not been slow to avail itself of the beneficial tillage. The plants on the thin-seeded portion are much more sturdy and bunchy in growth, having tillered more from the bottom, than in the case of the thick seeding, and the heads are of larger size, and more plump; promising a greater proportion of grain to straw than where the rows are at their usual distance. On July 25, from the thin-seeded portion of the field, three heads were gathered from the plat which has received no manure whatever since the commencement of the experiment in 1844, that is, forty-five years ago; three heads from the plat which has received barn-yard manure at the rate of fourteen tons per acre each year; and three heads from a plat receiving the following artificial fertilizers per acre: four hundred pounds ammonium-salts, three-and-a-half hundred-weights superphosphate, and two hundred pounds sulphate of potash.

The following diagram shows the size and character of the heads of wheat from the three plats—the variety is the Red Club—and the table gives the weight of the heads, with the average yield and weight per bushel of dressed grains from the same plats extending over a period of thirty-six years, 1852 to 1887.

How Treated.	Weight of the 3 heads.	Average yield per acre.	Weight per Bushel.
	Grains.	Bushels.	Pounds.
Without manure	278	13	58
Barn-yard manure	298	33¾	60¼
Artificial manures	307	31½	60

The accompanying engravings show the comparative appearance of the different specimens. The tillage operations necessary for the destruction of the weeds doubtless favors also the liberation and the distribution throughout the root-searching area of the wheat plant of the mineral food of the crop, in a manner that it would be impossible to emulate in the mere application of direct manures. Teaching us that rich, deep soils which contain a high percentage of nitrogen, provided such soils are well worked, have within themselves a greater aptitude both to acquire more plant-food and to yield up their accumulated stores of inherent fertility to the crop.

WITH BARN-YARD MANURE. WITH ARTIFICIAL MANURE. WITHOUT MANURE.

By frequent stirring or tillage, the surface soil is thoroughly exposed to the influence of the air, and is kept in a mellow and porous condition that is exceedingly favorable to root-distribution. By this means also capillary attraction is diminished, and the land suffers less from drought, the water-holding power of the surface soil being thereby increased.

Dehorning.—Every dangerous bull should be dehorned. The operation is best performed on young calves, but can be done on mature animals without injury. Bulls should be exercised and trained to work. Idle bulls indicate extravagance in farming. A bull can do as much work as an ox without injuring his breeding qualities.

PROFITABLE CULTIVATION OF HORSE-RADISH.

PETER HENDERSON.

Any soil that will grow a good crop of potatoes, parsnips, carrots, or beets will answer for horse-radish—that is, it should be a rich, sandy loam, well drained. Horse-radish is usually grown by our market-gardeners in conjunction with early cabbage or beets. The early cabbage is planted at a distance of twenty-four inches between the rows, and sixteen inches between the plants. After the cabbage is planted, the horse-radish is set between the rows of cabbage, and at the same distance apart for the plants, which gives, when finished, some 12,000 or 13,000 each of cabbage and horse-radish per acre. The mode of planting horse-radish, to obtain the

FIG. 1.
HORSE-RADISH SET.

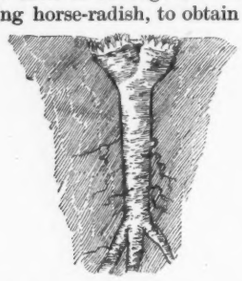
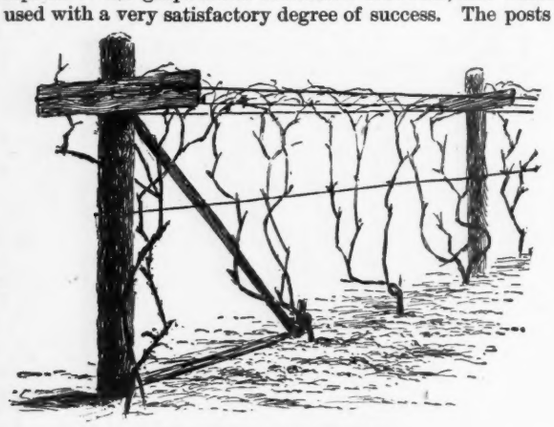


FIG. 2.
FULL-GROWN ROOT.

clean, heavy roots which the New York market demands, is to use sets, as shown in Fig. 1. These should not be less than six inches in length and from one-fourth to three-fourths inch in diameter. The planting is done by making a hole, with a light crowbar, about nine inches deep, and in this is dropped the set, thus leaving its stalk three inches under the surface, the earth being pressed against it by the dibble in the usual way. Care must be taken that the set is dropped right end up, and, to guide the planter, the set is made as shown in the illustration, the top being cut square and the bottom slanting. The planting is done here in April, at the time cabbage is planted, but, being set three inches below the surface, it does not start above the ground to any extent until the middle of June. By that time the cabbage is cut off so that the horse-radish crop takes its place, after which nothing further is done except to keep the crop clean by cultivation. Planted in this way, on good soil, it will give five tons to the acre, or nearly one pound per root. The full-grown root is shown in Fig. 2. The average price for good quality during the last winter has been $80 per ton, or about $400 per acre, and this, too, mostly grown as a second crop. If grown alone without a cabbage crop, planted as described above, it would probably yield more per acre.

A BROAD-TOPPED GRAPE-TRELLIS.

Mr. C. B. Rockwell, of Illinois, furnishes us the drawing and description of the grape-trellis illustrated herewith, and which he has used with a very satisfactory degree of success. The posts are



IMPROVED GRAPE-TRELLIS.

somewhat stouter than usual, and set ten feet apart. Near the top of each, and six feet from the ground, a cross-piece is firmly spiked. The cross-pieces were at first made two and a half feet long; but three and a half is found to be better. The lower wire is strung along the posts three and a half feet above the surface of the ground. Two and a half feet above this a second wire is strung from the centers of the posts at the intersection of the cross-pieces. Two others are strung from the extremities of the cross-pieces, horizontal with the upper wire, and one foot nine inches distant on each side. Mr. Rockwell writes us: "The object of using the broad-topped trellis is to give the grapes all the room possible. In our soil the canes will make a growth of fifteen to twenty-five feet in a year, and it is necessary to give them support without carrying the trellis too high. On the row trellised in this way I had, last year, twice the quantity of grapes produced upon any one of the rows adjoining it. They were more free from rot and more convenient to gather."

AN IMPROVED MAIL PACKAGE.

Mr. J. H. Evans, Nez Perces Co., Idaho, sent us last autumn some specimens of fruit in packages so ingenious, easily made, and effective, that we have had a picture of one engraved, and present it below. The package is simply an old tin fruit-can. One end is first removed by melting off the solder, and the article to be sent is securely packed within. The upper edge is then slitted all around, the slits being cut about three-fourths of an inch deep, and the same distance apart. Of the narrow tongues of tin thus cut, every other one is bent inward to a right angle, leaving the others erect. A circular disk of stiff pasteboard, having been cut to fit, is laid in, and the remaining slips of tin, which are shown erect in the engraving, are bent down upon it. A paper wrapper, upon which the address is written, is then pasted around the package, and it is stamped and ready for the mails. Such a package is secure, light, and readily opened for inspection by the post-office people. The invention is not patented.

STORING TOOLS AND MACHINERY OUT-OF-DOORS.

W. E. PARTRIDGE, NEW JERSEY.

"All out-doors" as a storage-place has nothing in its favor except its cheapness and the ample space to be had for the asking. It is a bad place for tools, and infinitely worse for machines. The rake, spade, plow, or harrow suffer from exposure. But the mowing machine left for weeks outside, where last used, is suffering in an altogether different way. The dampness is the first great enemy. The dew makes the first attack on the varnish. When this has cracked the dampness gets into the joints. Not in one night, it is true, but it gets there. The mower has, fortunately, few parts of wood. It is like a mule in that it can stand much abuse. But, like that much-maligned beast, it has its methods of revenge. When the rust invades the joints, the bearings, and the various working parts, something has happened that does not appear on the surface. The metal has been roughened. If it is a sliding or a turning piece it does not slide as before. The polished part, the piece of steel, resists longer than the others, but the dew and the rain accomplish their work at last. It seems to all rub off after a little, but the surface is not as smooth as before, and more power is required. The day's work tells more severely on the team. So the machine in time takes revenge for the neglect. Rain and wind add their effects to that of the dew, and the sun finishes the work. The results accumulate and the life of the machine is shortened. The farmer says it "wore out." "Machines cost more for repairs than they are worth." But the sun and rain and wind and dew have helped to make the repair bills. The reaping machine has more points for attack than the mower, and yet it has to share the neglect that falls to the mower. There are more parts, diverse materials of small durability, yet the machine stands out. The wood warps as it dries, and the cracked paint and varnish admit the dampness. All sorts of things happen at the worst possible times. Everybody in the field knows "it was an accident." How many of them think that there were preventable causes for that broken casting?

IDAHO MAIL PACKAGE.

Rust is iron's enemy. The trace-chain as well as the cutter-bar, the plow-bolts, and the spade, all feel the effect of it. The breakdown may be put off for a time, but when it does come, at the worst possible moment, one can be sure that it is neglect that has hastened it. Sand, poor iron, cheap workmanship, and bad design all come in for a share of the blame. They are all bad, but all are made worse by using all out-doors for a storehouse.

GOOD CABBAGE—HOW TO GROW IT.

C. L. ALLEN.

Where cabbage can be grown at all, its cultivation is very simple, and success is more certain than with most other vegetable crops. The congenial home of the cabbage is in a rather cool climate, moist atmosphere, and in a heavy sandy loam with an open, gravelly subsoil. Cabbage will grow on other soils, under the same climatic conditions, but only under protest in a clay soil, with hard-pan underlying, unless artificial drainage is afforded, no matter what the climatic conditions may be. The cabbage is a gross feeder, and its growth is proportionate to the amount of food given it. To have cabbage early, tender, and delicious, and to have it productive, it must be well fed. The secret of success that attends its cultivation by the market-gardeners near New York is the vast quantity of manure used. For early cabbage, the manure is put on the ground, which has been plowed the previous fall to the depth of three inches. It will require at least seventy-five tons to the acre. This will give a yield of 11,000 heads of the Wakefield class, and about 9,000 of the Early Summer, or its synonyms.

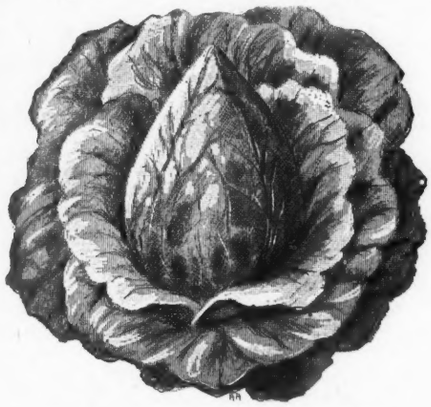


FIG. 1. JERSEY WAKEFIELD CABBAGE.

The question may be asked, and with propriety, can the growing of cabbage be made profitable, with such an outlay for manure? That all depends upon the cost. Near New York, and presumably near other large cities, the market-gardener gets very much of his manure at a cost not exceeding one dollar per ton. This is obtained from small stables which the collectors do not visit, and the owners are glad to have it taken away. When the gardener has delivered his load of produce, he loads up with manure, which makes the cost very moderate.

Where manure cannot be cheaply obtained, cabbage should be grown on sod ground, which, for early market purposes, should be plowed not later than the first of October. This will give the sod sufficient time to rot before the ground needs working in the spring. It is not essential to have the sod rotted; it is better not; but it is absolutely essential to have the roots killed, so that growth of grass is impossible. Then the growing crop will consume the previous growth which remains in the ground as fast as it decays, without waste. There is no fertilizer cheaper or more effective for cabbage or other crop than a decaying sod.

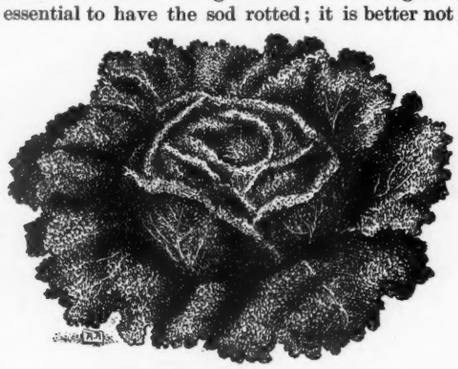


FIG. 3. NETTED SAVOY CABBAGE.

For late cabbage the field should be plowed about the middle of May, when the grass is in the most active state of growth; it is then as effectually killed as though plowed in autumn. Manure should be put on and plowed in about the middle of July, or just before the setting of the plants. Fifty dollars per acre, either of commercial or barn-yard manure, will be sufficient for a yield of 7,000 heads per acre.

Varieties.—The best variety of cabbage, either for the market-gardener or the family garden, is the Jersey Wakefield, Fig. 1. Of this there are two varieties, the early and late. The latter is about a week or ten days later than the former, and is about one-third larger. This variety is now very popular with the market-gardener as a succession, coming in between the Early Wakefield and the Early Summer. For very early cabbage it is a common practice to set what is known as cold-frame plants. The seed for these is sown in September, the plants pricked out into cold-frames, and wintered over. This system of growing is not as popular as formerly, experience having proved that seed sown in a hot-bed or greenhouse about the first of March will give better plants than those wintered over, and at much less expense. These plants can be set as soon as the ground is in suitable condition for working. The market-gardeners near New York commence as soon as the first of April. The time for setting the plants of course depends upon the locality.

For a succession, after the two strains of Wakefield, Henderson's Early Summer (Fig. 2) is one of the best. Seeds sown at the same time of the Wakefield will make plants for setting as early as the former, and perfect heads will be obtained by the time the Wakefields are gone. A second sowing of the Early Summer can be made when the first seeds are sown in the garden. These will make plants for a further succession.

For family use, after the Early Summer, none will compare with the Drumhead Savoy, particularly the variety grown on Long Island, which has several local names. This is decidedly the most tender, and has the most delicate flavor of the whole cabbage family, and why it is not more generally cultivated is one of the peculiarities in gardening I could never understand. The market-gardener says quality does not enter into choice. It is simply size and weight that makes a variety valuable for market purposes. This we can understand, but cannot see why the Savoy should be rejected from the family garden. For late cabbage, the Savoy is one of the best as a keeper, as well as for quality. The next choice is All Seasons, one of the best for a general crop, as it comes in very soon after early summer, when the seed is sown at the same time, and is good for a succession, besides being an excellent keeper when planted for that purpose. In the choice of varieties for a general crop, locality is to be considered. A given variety will not thrive alike in all situations any more than a given variety of apples will. Experience must show the grower what sort is best adapted to his garden or field, and that variety is the one to grow.

FIG. 2. EARLY SUMMER CABBAGE.

Cultivation is first in importance with any variety. There is not a garden vegetable or field crop that demands more attention than the cabbage; none will resent neglect so quickly. As soon as the plants are established, the cultivator should be set at work in the field, the hoe in the garden; not only should they be set at work, but they must be kept at work—persistent work in cultivation is the price of cabbage. The cultivator will not long do in the field; the small plow must follow, as no other implement pulverizes the soil as well. In the garden the fork must follow the hoe. Plow deep and dig deep. Plow often, and dig often, and industry will be rewarded by a generous crop.

THE VEGETABLE GARDEN

Where plenty of garden vegetables are required, frequent sowings or plantings should be made. The spring fever of vegetable gardening is generally of short duration, and is at its height when it first comes on. The owner of a small garden is apt to have it so seriously, that undue haste is made in all the operations; plowing or spading is not half done; the surface is barely stirred up enough to show that some one has been over the whole ground; fertilizers are improperly applied, and plantings are made with hands unguided by experience or judgment. All the seeds are put in on the same day, and the work finished up as rapidly as possible. The result is, in many cases, that at no time does the garden afford vegetables worthy the name.

For the best success a series of plantings should be made of vegetables which are of rapid growth and short duration. In this class are the radishes and lettuce, which should be planted, together with onions, beets, parsnips, and carrots, as early as the soil can be brought into proper condition, but never before. More crops are injured by sowing the seed when the soil is too wet and cold than from almost any other cause. A sowing of radishes should be made every ten days until the first of June, and then again in September. Peas should also be sown in succession until the first of June. Plant a few at a time, in order that the whole crop may be consumed when in the best possible condition. It is far better to eat canned peas than half-ripened ones from the vines. A planting of peas can be made to advantage after early potatoes, if the proper kinds are selected, and for this purpose the various "earliest of all," or this class of smooth peas, are the best. It is folly to plant for a late crop the large, wrinkled varieties, as only a crop of mildew will be the result. Two plantings of beets in spring and one in August will keep up a succession of this vegetable, tender and sweet. Sweet corn should be planted every week, say twenty hills at a time, from the first of May until the middle of July; this will afford an ample supply for nearly three months. Beans should be planted at intervals of two weeks, the last planting to be made the first of August. This crop, if not wanted for snap-beans, can be used to good advantage for pickling.

A small planting of strap-leaf turnips should be made as early as possible in the season, and another on the ground where the early peas or potatoes were grown. A still later planting of turnips, as well as rutabagas, can be made about the first of August on any vacant ground. Wherever there is a vacant spot, no matter how small, spinach should be sown, if for no other purpose than to turn under as a vegetable manure. It is important to make a late as well as an early planting of tomatoes. For the first, put out strong, stocky plants; for the second, drop a seed or two in each hill of early corn, and, as soon as the corn is done, cut the stalks to the ground, and a splendid crop of tomatoes will be secured, which comes in very useful after the first has ripened its best fruits. By this method of planting, the garden will yield more than double its usual crop, and the vegetables will be far better than the straggling, tough, indigestible things usually gathered.

PROFITABLE ONION CULTURE.

There are few uses to which land can be put that will, under favoring circumstances, pay a larger money return per acre than in growing onions from seed. Yields of from five hundred to eight hundred bushels are sometimes harvested from a single acre, and in former years one dollar per bushel has not been infrequently obtained. The knowledge of such possibilities has often tempted farmers into the cultivation of this crop without due preparation and without a proper knowledge of the requirements essential to success. The result has been not only a money loss, but such discouragement as has precluded further ventures. Onions are an expensive crop to grow, and during their early stages demand a great amount of steady and hard work that is most unpleasant to remember when the effort has resulted only in failure. Among the drawbacks to success which beginners will encounter, are:

First, the effort to do too much. It seems, on paper, as if anyone should be able to manage at least an acre of onions. But if the onions have to take their chance with a field of corn, or a potato-patch, or a good-sized garden; in short, if labor is not to be available for it just when needed, without regard to the demands of any other crop, a few square rods will pay vastly better than an acre.

Second, the lack of proper ground. Onion seeds are slow to germinate, and if the soil is full of weed seeds they will cover the ground before the onions are up, so that when the latter do come it will be as difficult to find them as to find the traditional needle in the haystack. It is absolutely necessary that the ground to be used for onions should have been cultivated for at least two years previously with hoed crops.

Third, scant or improper fertilizing. The onion, during growth, absorbs an immense quantity of the nutritive elements of the soil, and it is not only required that these shall be present in the soil, but they must be in such form as to be readily assimilated. Coarse barn-yard manure, newly-made, would be of little value; but the same, well-worked into the soil the previous season, would help fit it for use the following year.

Fourth, inadequate preparation of the soil. If the soil is not put in the finest mechanical condition before planting, failure will be pretty certain. It will be futile to attempt to remedy this defect by subsequent cultivation, as the only implements that can be used are such light ones as the hoe, steel rake, garden hand-plow, and hand-weeder. The seeds are very small, and have a tough epidermis. It is folly to expect them to germinate if lodged among clods. The surface soil, for a depth of two inches, must be as fine and mellow as the roller and the steel rake can make it.

Fifth, if all these drawbacks can be successfully avoided, and poor seed is used, failure will yet result. It is hardly conceivable that any precaution for assuring one's self regarding the quality of the seed should be neglected, especially when it is so easy to "make assurance doubly sure." A hundred seeds sown in a box of rich soil, and kept warm and moist upon a kitchen shelf, will tell the story within a fortnight. Ninety per cent of the seeds should germinate, and unless at least seventy-five per cent do, it will not pay to use it.

If one is able to comply with all these requisites, can successfully weather droughts and floods, has the capacity for infinite painstaking, and will be satisfied with the day of small things, he may wisely venture to plant a small portion of an acre, and if his first crop yields at the rate of two hundred bushels, and does not sell at less than forty cents, he should consider it sufficient encouragement for continuing and extending his venture.

CUTTING, BUNCHING AND SHIPPING ASPARAGUS.

As the green part, or that which grows above ground, is all that is eaten of asparagus, the more green there is the better price it will command in market. For the South and early cuttings it may be cut when two to three inches above ground. But for near-by and later, it should have from four to six inches of green stem, and be cut low enough to leave some white on, as the white part of the stalks will not shrink or draw up and loosen the bunch. The bunches should be from eight to nine inches long, and four-and-a-half across the butts. The asparagus should be sorted or culled, leaving all broken and small sprouts, which can be bunched by themselves and sold as culls. The heads should be all placed evenly at the top, and the butts cut off squarely, using great care in handling not to bruise nor injure the heads, which soon ferment and decay. The heads should be kept dry, as moisture causes decay.

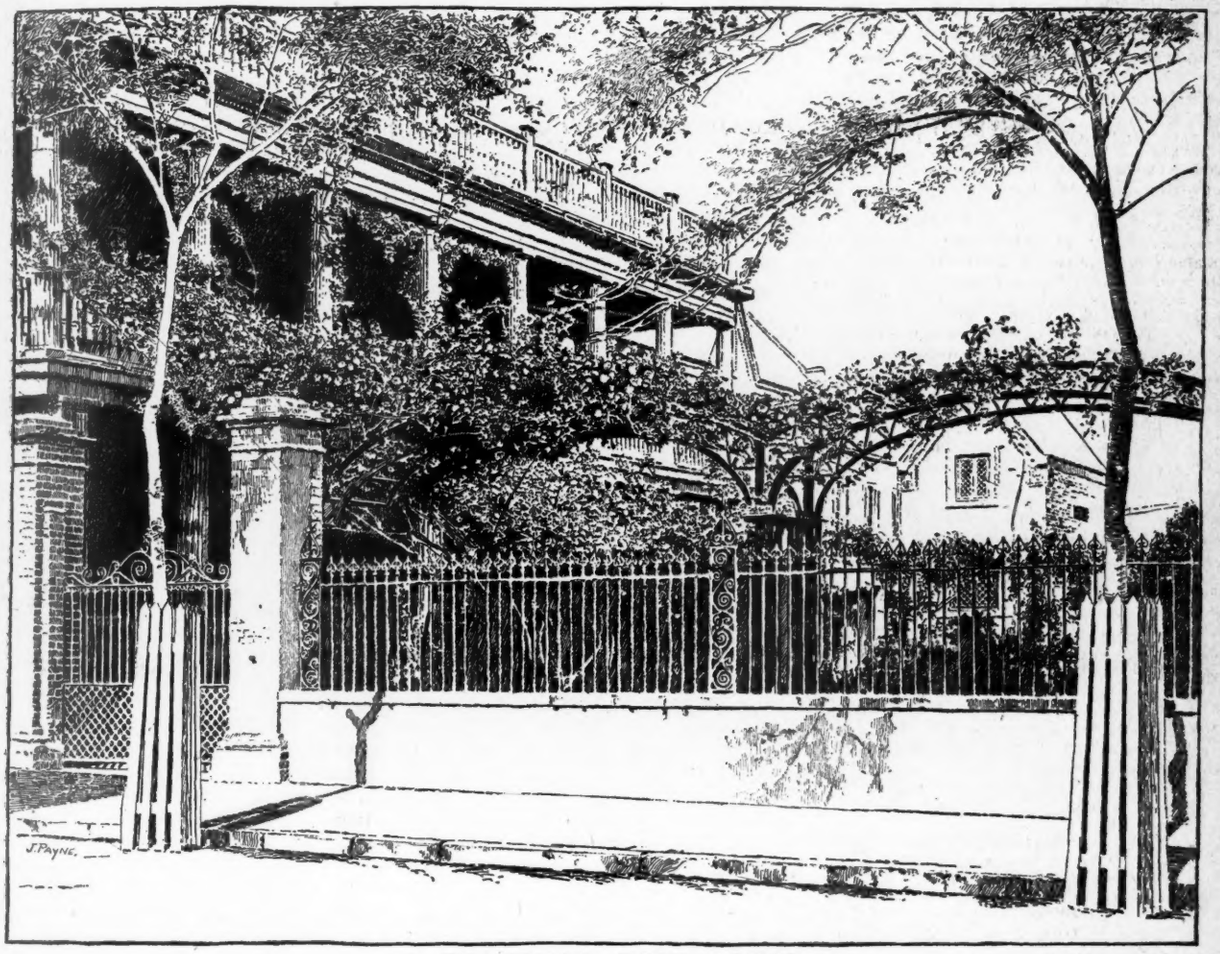
Good, strong Japan Raffia is the best to tie with; and it is necessary to use a box or a bunching machine, so that the bunches may all be of a uniform size, and tied so tightly that they will not fall to pieces in handling. The best knife for cutting is a carpenter's thin firmer gouge, one-and-a-half inches wide, nearly flat, and the thinnest that can be obtained, ground on the convex side or back, about one inch from the end, which should be rounded off on the inside to prevent them from injuring sprouts near by. Take the sprout between the fingers of one hand and run the knife close to the sprout, the concave side next to it. Tip the handle away to give it the proper slant; shove down until the cut is made, and then pull the sprout. After cutting and sorting, take a convenient number of sprouts by the upper ends, and rinse the bottoms in clean water to free them from dirt, taking care not to wet nor bruise the heads. Then put them in the buncher, keeping the heads all up even against the stop. Lay them straight, and when there are the required number to make a bunch, press down tightly, but not hard enough to crush them. Put a tie around them three inches from the top, and another four inches below that, making the knots secure. With a sharp knife cut the butts square and even. To keep them until ready for shipping, set on wet grass or moss, in the shade.

Crates for shipping should have two ends and a middle piece, each twelve inches wide, eighteen inches long, and about three-quarters of an inch thick. The bottoms, sides and slats are twenty-eight inches long. Nail on the bottom boards close together; have side boards six inches wide, and put slats on the rest of sides and

top, leaving broad interstices between them for ventilation. Put in enough wet grass or moss to pack down two inches thick; stand the bunches butts down on the moss, tightly, leaving the heads about one inch below the slats. When the crate is full, crowd some wet moss all around, to prevent shifting during transportation.

A FAMOUS ROSE.

Our engraving, drawn after a photograph, represents a perspective view of one of the most noteworthy rose gardens in the South-Atlantic States, that of Dr. Charles U. Shepard, Charleston, S. C. While this view, taken from Meeting street, shows the most striking features of the grounds, the lover of roses will derive no less pleasure from a walk among the parterres and flower-beds which surround the doctor's elegant mansion and model laboratory. Here thousands of specimens in hundreds of the choicest varieties of Teas, Noisettes, Hybrids, etc., which, at the North, require special



A BEAUTIFUL ROSE ARBOR.

care, under glass even, greet the eye, and spread their fragrance through the balmy air. To the right of the gate grows the venerable Lady Banksia, upon which were budded all the roses which now cover the trellises, forty feet in length and twelve feet in width, and which embower the piazzas for a length of sixty-five feet and a height of forty-five feet. Upon this parent stem, which is known to be over fifty years old, and measures over twelve inches in diameter, are growing Maréchal Niel, Cloth of Gold, Climbing Devoniensis, Reine Marie, Henriette, Reve d'Or, and Climbing Mlle. Eugenie Verdier, vieing with each other in luxuriance.

Dr. Shepard is a fearless experimenter, and, to disprove the generally-accepted theory that climbing roses will not succeed when trained upon copper wire, has built an entire trellis of copper wire (an extension of that seen in the engraving), upon which all the varieties named above thrive and flourish vigorously, a living proof of the anti-copper-wire theory. When we saw the grounds, last March, many varieties were in bloom; in fact—owing to the sheltered situation and congenial conditions—flowers may be found at any season, but the great feast of roses occurs here in April, when a visit to this charming spot affords a sight not soon to be forgotten.

ASTERS FOR MARKET.

F. PARK, LONG ISLAND, N. Y.

C. F. Davison, Norfolk Co., Mass., desires information about growing asters on a large scale. The cultivation of asters for cut-flowers is attended with the same uncertainty that all cut-flowers are subject to: failure of crop and want of a market. With a good crop and a good demand, the growing is very profitable. For this purpose a succession of plantings should be made; the first as early as possible. If the plants are started in a hot-bed, an early crop may be secured, which usually brings a good price. The second planting, or sowing, should be made as soon as the ground is in a suitable condition for seed-sowing. Neither of these plantings should be large, as there is but little demand for cut-flowers in mid-summer, when these would come in. The main sowing of seeds should be the 20th of June and about the first of July, which will give an immense crop from the middle of September until the middle of October, a season when they sell to the best advantage. It is well to remark that the usual first frosts do not injure the flowers.

Asters should have plenty of room; plant, in rows about thirty inches apart, plants six inches apart in the rows; this will give sufficient room for the cultivator, which should be kept constantly going; that is, cultivation should be constant and thorough. Asters will grow in almost any soil, but prefer a good, lively loam, made rich.

The great popularity of this flower has induced dealers and growers to list varieties almost innumerable—many of them abuses of nomenclature. What are popularly known as Truffaut's Peony-flowered Perfection, New Washington, and the Victoria, are all that need be desired; and of these at least two-thirds should be white, the remainder rose, scarlet, or crimson.

A D. D.'s Advice to Young Housekeepers.

EDWARD EVERETT HALE.

Prince Albert wrote a very sensible letter to his daughter when she went to housekeeping. It is the daughter who is the mother of the present emperor of Germany. In this letter he bade her calculate in advance, as well as she could, the uses she would make of half her income. And then he adds these words of wisdom: "Mr. Unexpected will take up the other half."

This remark is painfully, sometimes fatally, true. But there is one branch of family expenses in which Mr. Unexpected need not appear so often. There may come cousins and aunts of a sudden, to stay with you for four or five weeks at a time; then, of course, Mr. Unexpected brings in his bill for feeding them. But you must not say that it is he who provoked you into expense when you chose to give a party which you did not plan at the beginning of the year, or when your husband brought home five or six friends to dinner, and you had to send out for some chops or some steak. Such affairs as these are not fairly to be charged to the Unexpected account. For the rest, if you know how many people you have in the house, you can make up your mind quite accurately at how much expense you shall feed them, and you can bring your expenses within those limits. I believe that young people who set out with a determination to do this, escape many of the annoyances of life, and, after a dozen years, they like housekeeping and believe in it. On the other hand, those who have not started so, at the end of that time are apt to dislike housekeeping and to try some other experiment.

In the midst of the Civil War, I wrote a little tract on this subject, which I called "What shall we have for dinner?" I have been glad to know since that it has been of some use to people. Circumstances have changed since then. About the time I wrote that tract I paid a dollar and a half for two pounds of tenderloin beefsteak; I have never done that since, and I hope I shall never have to. I cannot, therefore, cite the war prices of my dinners then as an example of what your dinners may cost you now. But, after twenty-five years more experience, I should like to give young housekeepers a few central statements as to how they shall spend their money for one hundred and seven different articles, which John and Jane, or Darby and Joan, or Frederick and Maud, are going to devour as a year goes by. How should I know what their names are?

Observe that you may feed your family, if you choose, on salt pork and hardtack, with such varieties as shall prevent scurvy and maintain reasonable health; or you may feed them, on the other hand, as I was fed at Delmonico's, the night I dined with the graduates of Union College, and have the plates changed twelve times, beginning with oysters on the shell and coming out with candied orange and black coffee. But, whichever scale you take, there are certain fixed principles involved, which you may find it convenient to keep in mind.

First, as you and I live, every grown member of your family consumes about one barrel of flour a year. Second, the bread which is made from wheat flour is as convenient a form of nourishment as you can well give the people who depend on you; but it is not sufficient alone for our modern life. You must give to those whom you love more nitrogen than they will get in their wheat bread; that is one reason why you give them butter, or beef, or mutton, or other animal food. The reason why you do not feed them wholly on vegetables is that we cannot spend so much time in digesting or ruminating as the cows do, and we must have some food which we can digest more rapidly.

In practice, your butter will be the largest single expense item in your list of one hundred and seven articles, unless you make it for yourself. Your flour will come next; then your beef, mutton, turkeys, chickens, lamb, and veal, unless, as I say, you make them. If you take my advice, you will not buy any fresh pork. If you have an old lover in the country who wants to show his admiration for you by sending you a piece of fresh pork from a pig which he fed himself and killed himself, I do not object to your accepting it; but I would not, if I were you, go to the corner store and buy it. If you have to buy your food—your butter, your wheat flour and bread, your beef and your other meats—all together will cost you about one-half of what you spend for eating and drinking. The other half will be divided among tea and coffee, milk, and sugar. Recollect that milk is generally cheap food, though not always. Sugar has lots of nourishment in it, though you cannot live on sugar, and the general custom of economizing in the purchase of sugar is based simply on the Puritan wish to prevent people from eating what they like. I used to say that you might count for your fish two per cent of your yearly expense, for oysters two more, and for eggs perhaps four per cent. Eggs are sometimes cheap food and sometimes dear; this depends on the accident of the market. I remember that in my old list I let people spend four per cent on potatoes. They are a poor compound of starch, but people like them. If you like them, of course you had better have them, but they should not be made a principal article of diet.

Now, for what is left, you must spend it on fresh vegetables, and then most of the hundred and seven articles will come in. You will want mace sometimes; you will have to give John two cents to buy some yeast with; you will want vinegar, pepper, and mustard. Sometimes you will order in a lobster. I hope there will be no need of porter or wine; but perhaps Joan's back will ache, or perhaps the doctor will think Leander should have a glass of wine to help his digestion. I hope you will not spend much on cream-of-tartar or on saleratus. But do not hesitate to vary the diet; indeed, it is in the variety of diet that you will make your table attractive and that you will bring about a good digestion.

And the general rules may be summed up briefly:

Vary the fare from day to day, so that there may be a certain surprise about the table.

Let the table every day be as simple as possible, so that as little as may be may be left over.

Take care of fitness of things on the table,—a cold plate for your butter and a hot one for your mutton,—so that what you have may be the best. Coffee well made costs no more than coffee badly made; it is worth while, therefore, to learn how to make the coffee, even if you make it yourself.

First, second, third, and last, recollect the sauce which Solomon suggests for a dinner of herbs, and recollect that the same sauce is necessary at the grandest feast which you can provide, even when Frederick's father and mother come to dine with you. A dinner of herbs with this sauce is better than the stalled ox without it.

Whether you be rich or poor, I do not think you want to be cheated. Whether you be rich or poor, I do not think you want to encourage any system which makes it hard for poor people to feed well. Hold then to these general rules: 1. Always buy as large stores as you can, because then you buy more cheaply. 2. Be you rich or poor, pay cash for what you buy, and do not embarrass yourself or the dealer by a lot of petty accounts to be paid at some future time. 3. Be you rich or poor, recollect that you must have plenty of carbon and nitrogen in you every day for the day's work. 4. Rich or poor, do not try to work the brain in the hour after you have eaten, but give that hour to the same purpose to which the ox and the ass and the cow give most of their time,—namely, to the assimilation of food,—so that the different organs of the body may have their rights and their share. 5. Recollect that no prices are permanent—that what is cheap one day may be dear another, and because your mother used to economize so on eggs at one season of the year, do not think you must economize so at another. Or, again, because you do not like salt fish, do not think there is no virtue in eating salt fish. If you can hold bravely to these rules for one year, you will hold to them in substance for the rest of your life, so largely will they diminish the annoyances of the duties of a housekeeper.

The young housekeepers whose fortune is so good that they have their milk, butter, cheese, eggs, pork (fresh and salt), chickens, ducks, geese, pigeons, veal, lamb, mutton, beef, all without paying for them, will understand that this article is not written for them. They can spend the time which its study would have cost them in taking to-day's pleasant reading in the Chautauquan course of the week.

The Children's Quilt.

CLARISSA POTTER.

I do not believe in cutting large, serviceable pieces of cloth into bits for patchwork; but why not utilize the remnants of baby's dainty slips and wrappers, and the older children's tires and dresses, by setting the scraps of cloth as patchwork squares in some simple, pretty pattern that one can catch up at odd moments to neatly fit and sew? Unless some such method is taken with the snippings left when cutting the children's clothes, how soon they disappear!—and when the little dress or apron is outworn, we may lose even the remembrance of it, a shred of which in the years to come might bring to mind many a pleasant memory of the child, long since man or woman grown, out in the world battling for themselves, or, may be, sleeping in God's acre.

When there are several little people in the family, how fast these bright bits of print and flannel accumulate! So many little garments to make for the restless, busy children, who are sure to find every nail and jagged splinter, and sharp knot in wall and fence and apple-tree limb, on which to hang a shred of their sleeve or skirt. Perhaps we scolded the little one for the ragged rent; and the possession of this bit of pink calico, or this scarlet dotted flannel, like the torn garment, will remind us of our lack of patience, and help us to set a closer watch over lips and voice; or, if the bit of cloth tells us of the earnest, tender talk we had with the little delinquent, who seals the promise to try and be more careful, for "Mamma's sake," with loving kisses, how precious will the bright shred be to us in the long stretch of after years, when that child has passed beyond our sight and care! I call the patchwork setting of such accumulations of scraps of cloth "the children's quilt." Shall I tell you about just one square of such work?

These pink-sprigged, corner-triangles are remnants of the dainty, ruffled, first short dress I made for my baby girl, who eagerly stretched out her little arms to have the pretty suit put on, and then proudly patted her crisp, rustling skirt and smoothed the ruffles and tucked her fat fist into the pocket, approvingly crowing over her new outfit. These half squares of brown and white checked gingham were left of the cunning scalloped sunbonnet I made for our eighteen-months old boy. He is a big fellow now, in long pants and No. 10 felt boots. But shall we ever forget how sweet and fair the little face looked peeping out from under the dancing scallops, and the close watch we kept of that little brown bonnet throughout two long summers, bobbing above the tall grass and among the bright flowers of garden and fields?—for we knew our blue-eyed baby was under it, safe and happy.

Scores of bright memories the brown gingham triangles recall; of baby here, and baby there, trotting from one play to another through those sunny summer days; and though the bonnet itself, with its third pair of chewed strings, and smooches of wheel-grease and paint and nail-tears from crown to cape, went out of existence long ago, not so its memories, kept fresh by the possession of this patchwork. These rectangles of plaided goods, crimson and blue and gold, stir thoughts not so pleasant—of a restless, dancing child lifted upon a table to have a new suit fitted; she wouldn't stand still, and the plaits and shirring would bother, and I was hurried and tired, and finally slapped the plump, bare shoulders that would hunch and twist; and these bright bits of flannel, like the new suit, vividly recall the sobbing little girl who came flying into my arms from the table's top, tightly clasping my neck and pitifully crying, "Mamma did hurt!" and help me remember and keenly regret my sorry lack of patience.

This center block of tiny polka-dotted print is a remnant of the four dainty, ruffled wrappers I cut when making eager, loving preparations for my first-born. Whatever else I may forget concerning the patch-pieces that make up "the children's quilt," fresh in mind will always remain those sacredly happy hours when with stealthy care I tenderly fashioned the tiny garments, and the revelations of joy and motherly anxiety and glad pride that were mine before my baby boy had outgrown his little print slips.

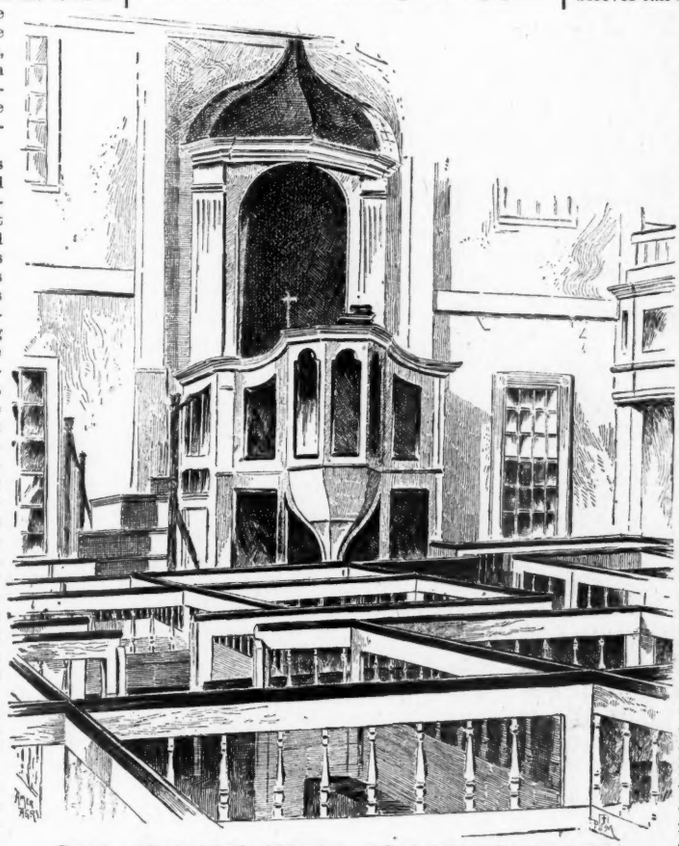
Scores and scores of cuttings, from this and that little garment, make up the patchwork setting of "the children's quilt;" yet, every triangle and

square has its history,—pleasant, sorrowful, or otherwise,—and when you and I are garrulous old ladies in gold-bowed glasses and smart caps with top-knots of rustling satin loops, we shall hugely enjoy gathering our grandchildren about us to tell them of these reminiscences vividly recalled by this quilt setting of patchwork cut from remnants of their mother's or father's tires and creepers and bibs.

Old-Time Worship and Worshipers.

WEBB DONNELL.

A most interesting picture would be a photograph of a congregation that used to assemble several generations ago for Sabbath worship. The quaint old costumes, some of which have been handed down, preserved in cedar chests, to the present generation, would present a striking contrast to fashions now in vogue, while the preaching, singing, and manner of getting to church, peculiar to those days, would seem decidedly strange to the eyes of those now living. One of the old churches where congregations gathered one hundred years ago is situated in the town of Alna, Maine, and suggests to the writer that many, perhaps, would be interested to get a peep at its quaint, square pews and its high pulpit, with massive sounding-board and "deacons' seat" below, and to read some account of the customs of that far-away day.



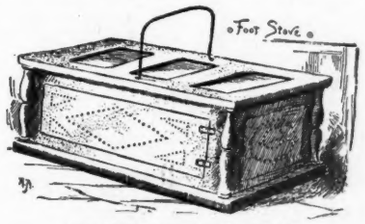
OLD CHURCH WITH SOUNDING-BOARD.

The church without is severe in its simplicity, blindless, and painted yellow. Within, one finds a huge gallery half way up to the ceiling, built about three sides of the room, and containing two rows, or tiers, of pews similar to those below. These pews form one of the most curious features of the whole edifice. They are perfectly square, with seats running around the four sides, except where the door is situated, so that the congregation must have presented a heterogeneous appearance to the preacher, some of them being back to him, others sidewise, and a portion facing him. A high railing surrounds each pew, with open-work below it, which afforded an opportunity for the small members of the family to catch a glimpse of the parson, as the preacher of those days was called. A portion of the gallery opposite the pulpit was occupied by the singers and the player on the huge bass-viol. The old-fashioned hymns, which were sung with much spirit and solemnity, are familiar to many modern worshipers.

No matter how cold the weather, a stove was not allowed in the building, as it wa sthought to be sinful to pander to temporal comfort; and yet, if this be so, there seems to have been some inconsistency on the part of our ancestors for, in rummaging through their attics, we find the old foot-stoves which they carried, full of live coals, to the meeting-house. As the services consisted of two sermons, both very long, one member of the family took these stoves, during the noon intermission, to a house near by and changed the dead embers for the glowing coals on the broad hearth of the huge fire-place—a fire-place into which a "sled-length" could be rolled for a back-log—and then returned to eat the lunch, which was as regular a part of a church-goer's outfit as was his hymn-book.

Those who rode to church went largely upon horse-back, the man of the family riding in front with his wife perched high up behind him on a "pillion." The smaller members of the family went on foot. In summer, many of those who walked from a distant part of the town came barefooted,—both girls and boys,—bringing their best shoes and stockings in their hands, until they were near the church, when they put them on and walked into the sacred edifice with shining footgear. Others wore their working-shoes until near the end of their walk, when their best "pumps" were carefully adjusted in their places, and the old ones hidden behind a stone wall. The men's best coats were of the swallow-tailed order, with a collar that was built up very high behind, the top of the collar being about even with the top of the wearer's ears. His white collar was of the "standing" order, opening behind as well as in front, and surrounded by a "stock" of black silk. His vest was prone to be of some color, or figured, with a plain background. The most striking part of the dame's toilet was her bonnet, or "calash," as it was called. It was made somewhat like a sun-bonnet, the top and sides coming out far beyond the face and made collapsable, so that it could be shoved back upon the head, as a carriage-top is folded back. For this purpose a small string, or piece of tape, was inserted in the top, the end hanging down in front. When the lady desired a better view of the landscape, or met an acquaintance, she pulled this string, and her bonnet folded gently back upon her placid head. The boys and girls, in their home-made and oddly-fashioned gowns, would present a queer appearance to modern youthful eyes; the boys with hair cut straight around their necks and across their foreheads, with short roundabouts for jackets, and the girls with pantalets coming down to the tops of their shoes and slippers, and usually made of the same material as the dress. "Ye tithing-man" is popularly supposed to have been a very active man, suppressing any tendency to levity on the part of heedless persons, or waking, with vigorous shake, the sleepy worshiper.

There have been great changes since those days, and it may be said, though not in a pessimistic way, that not all of the changes have been improvements on the old. The simplicity and single-mindedness of that old-time worship might well be emulated by the present generation, but we should hardly wish to return to the square, straight-backed pews, the antique sounding-board, the alert tithing-man, or the primeval foot-warmer.



OLD-FASHIONED FOOT-STOVE.

Spring Mending and Repairing.

ALICE CHITTENDEN.

House-cleaning is not the only trouble that looms up before the busy wife and mother as spring advances. All the spring and summer clothing is to be gone over, and although she may have been very careful to put it all away neatly mended, the little ones grow so rapidly. Annie, who last fall was only a little girl, has sprung up almost into a young lady, and last year's dresses must either be lengthened or handed down to Julia, the next younger. Fortunately, even when you have no more of the material, and the dress is not hemmed or tucked or turned up, it can still be made larger. The fashions are very compliant. A dress of any solid color may have a piece of goods of contrasting color set in the skirt, of any width, to make the necessary length, the seaming being concealed by a row of feather-stitching in silk. Plaid goods may be used if the dress needs brightening. If it is short-waisted it may be lengthened with a wide belt and this hidden under folds of the goods. Sleeves can be made longer, either with deep cuffs of a different material or with "puffs" at the top. The outgrowing of flannels from shrinkage, or the increased size of the wearer, is another cause of work for the mother. If the flannels were not mended when put away, this must be attended to at once, so that the heavy ones of winter may be changed for those of a lighter weight. These should not be left off for summer gauzes until after the middle of June. Many a severe cold is contracted in spring by changing the flannels or leaving them off too early, and, as few people can comfortably wear the heavy winter flannels into the warm days of June, it is better to have sets of intermediate thickness for spring and early fall. I do not know a more agreeable or satisfying task (after it is done) than this same overhauling of underwear. It is such easy, pleasant work. Once the sorting is done, the patches basted on, the holes that are to be darned noted, and the worn garments of the elders cut down for the little ones, you have work that can be taken up at odd moments, and you will be surprised to see how quickly the formidable-looking pile will melt away. Never patch with muslin. Use pieces of well-worn articles of merino, or of merino hose of the same color. A word as to the buying of underwear: A good article, all wool, or three-quarters wool, will outwear three sets of the cheap cotton garments, which in the end always prove the most costly, besides failing in their mission of warmth and protection. There seems absolutely no end to the best natural wool garments, such as cost perhaps three dollars apiece, or six dollars a set. I have some which have been used for six years and are still doing good service. For three successive winters they were worn through the four months of the severest weather; for the next three years they did duty spring and fall, and I have now cut them down for one of the children, who, I have no doubt, will wear them several seasons. The bottoms of worn shirts of grown people make the nicest skirts for the wee toddlers. Cut them of the right length, put them on a band, and edge with crocheted lace, of red or white Saxony wool, or with a row of feather-stitching at the hem.

Advantages of Being Deaf.

CARRIE MAY ASHTON.

When I was a little girl an old man used to call at our home, when returning from the village, seven miles distant. He was quite deaf, but those who knew him best said that he could hear much better than he pretended to, and that he could always hear when you spoke of money or of something to eat. One afternoon about five o'clock my mother was frying doughnuts and had a panful standing on the table, when the old man rapped at the door, and being admitted took a seat by the

fire to warm himself. My mother said in a very loud voice, which he could have heard if he had chosen to, "A very cold day;" whereupon the deaf man replied, "Don't care if I do; haven't had any dinner," and stepped up to the table and helped himself to some doughnuts.

A middle-aged woman, who used to wash for those who desired her services, was very hard of hearing. One Sunday night a young man, Mr. J., called and spent the evening with her. When he was tired of entertaining her longer, the following dialogue took place:

Mr. J.—"I would like my hat."

Miss B.—"Did you say you would come again, one week from to-night?"

Mr. J.—"No, I said I wanted my hat."

Miss B.—"Oh! Did you say you would come *two* weeks from to-night?"

Mr. J.—(with a voice that could have been heard a mile)—"NO! *I said I wanted my hat!*"

It is needless to say that he did not call again.

A Philanthropic Dressmaker.

MARY C. HUNGERFORD.

All the world hears of John Howard and other great benefactors, who nobly give time, money, and thought to improve the condition of their unfortunate fellow creatures; but there are obscure, self-sacrificing and zealous philanthropists whose names are not sounded abroad. Of this class was Sarah Martin, a poor girl, who was early left an orphan in Yarmouth, England. At fourteen she was apprenticed to a dressmaker, and, after learning her trade, pursued it industriously to gain her livelihood. Like most other girls of that age, she was fond of finery, novel-reading, and company, but after her attention was called to the prisoners in her native town, her tenderness of heart made her forego the inclination to gratify those tastes and devote her meager earnings for the benefit of the wretched creatures confined in the jails and workhouse.

A sermon upon the duty of benevolence, which she heard one Sunday, confirmed her in the idea of making the work a spiritual duty, and she went about it with enthusiasm. At first she contented herself with visiting the neglected sick paupers, and giving one day each week to teaching the children at the workhouse. Gradually she gave more and more time, which to her was money, to comforting and consoling and reading to the sick and aged poor.

The prison in Yarmouth was a disgrace to the place. Being outrageously misconducted, and having no chaplain and no separate wards for the division of the sexes, it would hardly have been thought a safe place for a woman to visit; yet Sarah Martin entered it unshrinkingly, hoping to reclaim some of its disreputable inmates. Encouraged by finding one profligate woman touched by the interest she took in her, Sarah persevered and made regular and frequent visits, reading and explaining the Bible to those who were willing to listen to her. Insults and abuse were heaped upon her by unmanly men and still viler women; but, because a few were willing to listen, she bravely went on. At last her courage and persistency, when no good to herself was to be gained, conquered even such brutal opposers, and she was allowed to pursue her work unmolested, gaining finally the respect and attention of all, even the worst prisoners. Three days of every week she devoted to her self-chosen vocation, subsisting, on the remaining days, on the small wages she received from dressmaking in families. She gave satisfaction to her employers, and could easily have built up a good business for herself, if her heart had not been given to the benevolent work she pursued in her humble way.

People at last began to hear of and appreciate her goodness, and offer substantial help to assist in her charities. Every Monday she instructed such of the prisoners as would learn, in useful arts that might help them to earn their living honestly after their liberation; spending the whole day among them. Her Sundays she also gave entirely to the prisoners; and, after a time, she succeeded in establishing regular services, at which she delivered simple sermons of her own.

For twenty years her labor of love among the lowly continued, and she had the satisfaction of effecting many individual reforms, and of seeing a regular system of prison discipline organized as a movement consequent upon her unpaid labors. She died in 1843, and her memoir was written and published as a record of her humble piety and unaffected self-sacrifice, and, within a few years, with funds collected by private subscription in Yarmouth, an elegant memorial window has been put up for her in the Church of St. Nicholas.

Oil Painting—I.

INA I. ALLEN.

Many wives and daughters take up painting for the sole purpose of beautifying their homes, and many others would like to do so, but fear they have no genius for it. Now, Charles G. Leland, director of the Public Art Schools of Philadelphia, affirms that "any one who is the possessor of a straight eye and hands not disabled can learn to paint." While Ruskin, that exceedingly close observer of art and nature, and eminently sharp critic of men and things, goes so far as to say that "all which we call genius for fine art is simply an admirable memory." If this be true, surely there is a chance for all, for we do know that the faculty of memory, if poor to begin with, can be wonderfully improved by cultivation. The question, then, resolves itself into this—not, have you genius, but have you a taste for painting?—do you want to paint? If you do, then undertake it with a determination to excel, and throw into your efforts an enthusiasm that will brook no failure.

The first thing to be considered is the outfit, which need not be elaborate for early practice. The best materials should, however, be purchased, as poor materials are dear at any price. An easel, mahl-stick, palette, assortment of brushes and colors, oil and varnish, and palette-knife, comprise the necessary articles to work with. The easel is not absolutely necessary for early practice, but is pleasant and convenient. The mahl-stick can be made of any smooth stick about half an inch in diameter, with a pad on the end that rests on the canvas, while the other end is held in the left hand. The purpose of this is to support the right hand when painting small objects, or when special steadiness is desirable. The palette should be made of some nice hard wood, and should always be kept well oiled. The paint must never be allowed to harden upon it after using. With proper care, it will improve with age. There are two kinds of brushes in general use, the bristle and red sable. You will need small, medium, and large bristles, and small and medium sables. A few—say one of each kind—if of the best quality, will be worth more than whole stacks of inferior brushes. Quality, not quantity, is the rule, especially as to brushes.

Plaques and panels of various kinds are good for early work. These, as well as canvas and academy board, can be obtained of any first-class dealer in artist materials.

The colors needed for general use are silver white, light, medium, and orange cadmium, yellow ochre, light red, vermilion, madder lake, Antwerp, cobalt, and permanent blue, burnt sienna, bone brown, madder brown, raw umber, terra vert, zinneber green, and ivory black. If your work is for practice, you can substitute chrome yellows in place of the cadmiums, as they are cheaper, but not reliable. The same is true of Vandyke brown, which may be used instead of bone brown. Madder lake is one of the more expensive colors, and by putting blue with rose madder you get a good and reliable substitute. The silver white of Schonfeldt is the best white in use. In general, Windsor and Newton's colors are the standard, but many of the American makes, among them Devoe's, are coming to the head. Use poppy oil to thin the paints with if they are too thick; the less used the better, generally speaking. Siccatrie de Courtray is a dryer; use one drop to five of oil, if in a hurry for your work to dry.

An Ungrammatical Society.

DORA HARVEY VROOMAN.

I notice in the December number of the AMERICAN AGRICULTURIST an account of "A Gentlemen's Club." It recalls to mind what we used to do in the dear old home on the farm. There was a large family of us, and most of the children were fond of reading. Our parents subscribed for some good papers for us, but long before the week or the month passed, and it was time for a new number to come, we knew everything in the papers by heart, from the frontispiece to the advertisements on the last page. The question of how to get some more reading matter often puzzled us; but we finally hit on the following plan:

Some one suggested that everybody who made use of ungrammatical words or sentences should have a black mark put down against him. At the end of each month these black marks were added up, and we each paid a penny for every one opposite our names. This money was devoted to the buying of books. Some of us were not very scholarly when we began; so the "Improvement Society," as we called it, lasted for a long time; but we finally had to discontinue it, because we made so few "slips" in our conversation. While the society did last, we made enough money to subscribe for a number of good magazines and papers, besides buying some standard books, like "Pilgrim's Progress," "Uncle Tom's Cabin," and "Robinson Crusoe."

Having some one ready to correct your grammar at any moment puts one on one's guard. It will prove a wonderful teacher. Try it, girls and boys.

Domestic Art.

ESMA RAY.

The refining influence of an attractive home is almost beyond estimating. Some ornamentation is needed to take the bare, stiff look from our rooms, and give an air of cheeriness and comfort. Much can be done with simple means, and that which there may be no money to buy the hands of love can furnish.

A fancy footstool is both useful and ornamental. Plain wooden frames can be bought for twenty cents each, and stained to represent cherry, walnut, or mahogany, as preferred. A cherry stool has a cover of olive plush, crossed diagonally by a wide stripe of Berlin work. Four plush balls are placed at each corner. It is a good idea to cover the stool with some pretty cretonne, and the handsome outside cover can be removed when the stool is in general use.

A pretty box for holding photographic or other views may be made of a cigar-box. Take one long enough for the views, and cover the outside smoothly with any desired shade of plush, and the inside with silk of a contrasting shade. Fasten a short piece of ribbon from the box to the cover, to prevent its falling back. Navy-blue plush, lined with golden-brown silk, is a tasteful combination for this purpose.

A lovely pincushion cover consists of a small square of pale rose-colored silk, embroidered with a design of buttercups and grasses. It is then mounted cornerwise upon a square of cream-colored silk, fastening it at the edges with fancy stitches. Around the edges of the foundation are then sewed small silk balls, an inch apart.

Pretty toilet-sets consist of a bureau-scarf, two mats and cover for cushion. A very handsome set is of linen, embroidered with clover heads and leaves, and edged with lace.

To make a handsome lamp screen, line a small panel of black velvet with pale pink silk. On the silk paint a branch of snowballs, and decorate the velvet with a spray of trailing arbutus or peach blossoms. Hang this like a banner on a brass standard, and finish the bottom with tiny gilt crescents.

A pretty wall-pocket is made from an ordinary palm-leaf fan. First steam it, to make it pliable, and then bend the edges together, and lace half way up with narrow ribbon.

Pretty bands for tying up parcels of table and other linen are made thus: Take a band of blue Java canvas, two inches wide and sixteen long; work a pretty design in cross-stitch, and mount on blue satin ribbon, leaving long ends for tying.

Table-scarfs are of nearly every variety imaginable. One that is particularly pleasing to the eye, because it does not suggest almost endless labor, is of olive felt, lined with old-gold cambric, on one end of which is stamped a pretty design of morning glories, outlined with gold-tinsel cord. The ends are finished with plush balls. Another is of cadet-blue plush, one end having a crackle daisy pattern. The flowers are worked in silks, while the lines are in gold-cord. The ends are finished with balls to match the plush.

A handsome scarf is made of crimson plush, one end having a spray of daisies embroidered in yellow braidene and tufted center, the leaves and stems being worked in arasene. On the other is a spray of forget-me-nots, done in two shades of blue braidene and French-knot centers. The leaves and stems are worked with filloselle, in the

olive shades. The fringe is of crimson and old-gold balls. It is lined with old-gold Canton flannel.

Pretty sets of table-linen for luncheons and afternoon teas are worked in open-work patterns, marking out different days, and trimming with crochet or pillow lace. Red, blue, and light pinks predominate in the embroideries.

A dainty twine-holder is made of pale yellow knitting-silk. Crochet a bag large enough to hold a small ball of pink wrapping-cord, such as druggists use. Suspend with a bow of narrow pink and yellow ribbon, tying a small pair of scissors in one loop.

A unique receptacle for a watch is made from a wide sash-ribbon. One end of the ribbon is turned under to form a pointed pocket, and the remainder is made into a bow, formed of one loop and two ends. One end is cut nearly straight, and the other is fringed to the depth of an inch.

Arrangement of Bay-Window.

The accompanying illustration shows a bay-window with shelving arranged about it, below the glass. In such windows it is impossible to use any kind of flower-stand, with the exception of a circular one, with good results. If the old-fashioned wooden one, consisting of half a circle, is used, the back of it will have to be placed next the glass, thus shutting out a good deal of light from the plants on its lower shelves; if turned with its back to the room, so that the plants can have the full benefit of the light, the effect is very unpleasant, for in no way can the back of it be made to look attractive, and most of the plants will be hidden from the occupants of the room. It is not

FLORAL BAY-WINDOW.

economical as to its accommodation of plants, because it takes up more room than almost any other arrangement would, and accommodates fewer plants.

If shelves are placed about the bottom of the window, as shown in the illustration, they will allow of an attractive arrangement of the plants, similar in effect to what florists term "banking." That is, the pots of those next the glass will be hidden by the foliage of the plants in the pots on the lower shelf, thus giving one the idea of a bank of foliage and flowers. The sun is admitted freely to all the plants, and it is easy to sweep the window without moving anything except the stand in the center.

I would advise every one having a bay-window to have it fitted with glass doors, so that it can be shut off from the sitting-room when sweeping and dusting are going on. It can be made a much healthier place for plants in this way, for they can be sprinkled, and the doors will retain the moisture for a long time, if kept closed. The air of most living-rooms is too dry for healthy plant-growth, and in this way this evil can be overcome.

Box Arm-Chair.

Arm-chairs made of barrels have been frequently illustrated in these columns, but the writer has never seen one made from a box, and he believes that his idea is an original one, and feels sure that those who pattern after it will consider it a great improvement on the barrel-chair in every respect. It is much easier to make; it is stronger; it looks better; and it has a place under the seat for clothing, papers, or whatever one may choose to stow away there.

The bottom is made of a box about eighteen inches square, and a foot or more in depth. The lumber of which the box is made ought to be about an inch thick, in order to have the requisite strength. The top should not be fastened to the bottom until the back of the chair and the arms are put on. These are fastened securely to the

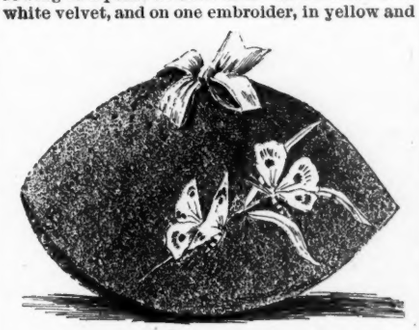
HOME-MADE CHAIR.

cover by nails or screws. The arms should come on the outside of both back and seat, in order to secure the greatest possible amount of strength. The back should slope at a comfortable angle, but the arms need not. After putting the back and arms in place, the top should be fastened to the bottom with hinges, from the front of the chair. If the top were hinged on at the back, the person sitting in it might some time take a lurch backward if he leaned too far in that direction.

Such a chair can be made by the boys of the household, so far as the frame-work of it goes, and the girls can cover it. Take pieces of old quilts, blankets, or something similar, wash them, and then use them for cushioning material. Have several thicknesses over the back and arms, so that they will afford a comfortable support for the body. A feather-cushion can be used for the seat if something softer is desired. When neatly covered with some pretty cretonne, or chintz, such a chair will be ornamental as well as useful, and whoever sits in one will say that it is vastly more comfortable than the old barrel chair. Casters should be fitted to the box, to make it easily portable. The bottom of the chair will hold a large amount of clothing, or whatever you choose to put in it.

Brazil-Nut Button-Box.

This dainty little article takes its name from being shaped very much like a large, three-sided Brazil-nut; and it is as useful an accessory to a work-basket as it is ornamental in appearance. To make one of these boxes, cut out of pasteboard three pieces exactly alike, five and a half inches in length, three inches in the widest part, and narrowing to a point at each end. Cover these with white velvet, and on one embroider, in yellow and



FANCY BUTTON-BOX.

russet-brown embroidery silks, a spray of leaves and two friendly butterflies, together with the query, "Button! Button! Who has the Button?" Three pointed pieces, the same size as the cardboard bits, must next be covered with thin yellow China silk and fitted in as a lining, all the parts being neatly overhanded together. The top, however, must be left open about four inches, and tied with yellow ribbon. The ends are squeezed when one wishes to put in or take out the buttons, and at other times hold them most securely. Of course, any other colors or designs may be substituted at the fancy of the maker.

Easter Tokens.

Easter is the high church festival which bounds the winter and begins the spring in the empire of fashion; the carnival of new bonnets and gowns. Within the last few years it has assumed a new importance in the feminine world, as it has become one of the great gift days of the year. Therefore, it is "the proper thing" to prepare tokens or mementoes for Easter, as well as for Christmas or New Year's. The shop-windows abound in dainty little souvenirs, which cost anywhere from ten cents to ten dollars, or many times ten dollars, for there are displayed, in some of the jewelry stores, crosses, butterflies, and eggs, set with diamonds and pearls. Easter eggs of rare and curious design, in finest china and porcelain, abound. The most beautiful of the new varieties are of Sevres china, in exquisite shadings of egg-shell tints, tipped with gold and silver. Exquisite porcelain eggs, in a variety of colors, with fine porcelain flowers in relief trimmed about them, are filled with bonbons for Easter gifts. These little conceits may be put to service after the bonbons have vanished, as they make dainty receptacles for jewels. One of the most appropriate of these is an egg covered with pale pink trailing arbutus, all in porcelain, each tiny petal molded and tinted in faithful representation of the hardy little spring flowers that gladden and brighten the Easter season with their

FIG. 1. FIG. 2.

EGG-SHELL VASES.

fragrance and beauty. Some of the egg-shells made from china are as thin and transparent as the shells themselves, and show the same delicate tints. Many of these have a broken, jagged aperture at the top. Filled into this is a bright silken bag, which may be drawn up with cord and tassels. Across the egg is printed in gold letters some appropriate motto, such as "A joyous Easter," or "Christ is risen."

A dainty, graceful little wicker basket, filled with flowers, is another offering which is in great favor. A bow of ribbon of some delicate shade is tied jauntily at one side of the handle. After the flowers have withered and faded, the basket may do service as a receptacle for thimble, needle-case, and some bits of fancy work.

A pretty banner may be made by taking a piece of ribbon six inches wide and nine inches long; ravel one end out to the depth of an inch, to form a fringe at the bottom. If you have the touch of an artist, you may paint some soft-looking, trailing design diagonally across the ribbon. This may be hung on a little brass or wooden stand (one may be bought for a trifle), to place in front of a lamp, to shade the eyes from too bright a light. But, if you live at too great a distance from the stores where these frames are sold, you may finish your banner in another way. Can you handle a jack-knife? If so, you are all right; if not, get some of your men-folks to do it for you. Whittle a stick of wood, the same width as your ribbon, into a nice, smooth, round rod; or, if you can find a piece of twig or cane that is smooth and round, you may use that instead. With a little mucilage, fasten the end of the ribbon meant for the top to this rod,

being careful to do so neatly, using as little paste as possible. Throw your ribbon over the front, so that the rod will not show. If you can get a silk cord, with a tassel at each end, you can tie it across the top, to hang it up by. A white satin banner, with a trailing-arbutus, apple-blossom, or wild sweet-brier design painted across it, and hung up by a white silk cord, would be very pretty indeed. If you cannot paint a design to look graceful and dainty, take a brush and, with some gold paint, make, in irregular, quaint-looking letters, across the satin, some motto, such as "Christ is risen," "A joyful Easter," "May Easter joys be thine," etc. Hang the banner up by a narrow ribbon of the same shade, or a pretty contrast to the color of the banner. Make a tiny bow where it is joined at each end of the rod.

Another neat little gift is made from a piece of satin ribbon. Take a length about an inch wide, and from twelve to fourteen inches long. This is to be a marker for a prayer-book, a hymnal, or a Bible. Turn one end back neatly, so as to form a point. To this sew a tiny tassel. Pigeontail the other end. Any pretty, trailing vine may be painted on this ribbon, and some favorite or appropriate texts may be lettered at intervals, in gold or sepia. This will be found very useful for a churchgoer, and it would be nice to have the receiver use it for the first time during the Easter services.

Pretty rectangular cards, with jagged edges, made of Whatman's paper, cost from four to seven cents apiece. They are made especially for decorating. Any one who can paint can make exquisite Easter cards, at a trifling cost, by buying some of these jagged-edged cards and outlining some pretty designs on them. A few delicate clouds, with a flight of birds, and beneath some sentiment in gilt letters, will not require very much talent, yet will make a dainty, pretty offering, to some loved one.

I must tell of a novel Easter gift, invented by a friend of mine. She was a young girl, earning her living by her pen and making fancy articles. She hit on this little token, and made hundreds of them, which she sold. With a pin pick a hole in each end of an egg. Then, holding it over a dish or saucepan, blow into one hole, and the white and yelk of the egg will go out at the other hole. You will be surprised to see how small the holes will need to be. With a small piece of Bristol- or pasteboard make a little roll or tube, about three-quarters of an inch long and an eighth of an inch in diameter. This is to form the neck or top of a vase; the egg-shell is to be the body. Cover this tube with some fancy or gilt paper. Fasten one end of it to the top of the shell with mucilage. Then make another little tubular piece of cardboard, a little larger than the other, and cover in like manner. Gum it to the bottom of the shell. Next, cover a button-mold, or a circular piece of paste-board, with fancy paper and fasten it to the bottom of the last tubular piece. This is the stand on which the vase is to rest. Then, with little gilt bands, make two handles, one on each side. This forms a little vase (shown in Fig. 1). Any little figures or flowers may be painted on each side of the shell, or you may decorate it with pictures such as come for scrap-books. A handle may be put on one side only, with a lip at the top of the neck, to represent a pitcher, like that at Fig. 2. This is decorated in Aztec style. Care is the greatest requisite in making these dainty little trophies.

While we revel in new bonnets and gowns, while we exchange our little tokens of love and affection, while we inhale the perfume of the flowers about us on all sides, let us not forget the first Easter. It was kept by a woman—a woman alone in a garden, kneeling by a tomb.

Children's Under-Clothes.

NELLIE BURNS.

The under-clothes of little children should be made with a special eye to comfort. Waists, drawers, and skirts should be made to fit the form well; should be neither too small nor too large around the waist, and all should be suspended from the shoulders. One waist will support both the drawers and skirts, but they should not be fastened to the same buttons. It should be made of stout material—white drilling is best. Face the bottom of the waist with a facing three inches deep. Half an inch from the lower edge of the waist sew on the buttons for the drawers, one in the middle of the front and one on each side. No button-hole is needed in the middle of the back waist-band of the drawers, as it is unnecessary to fasten them at that point. One and a half inches above these buttons place a row for the skirts, including one at a corresponding height in the back, on the button-hole side. The buttons used should be of quite a large size, as the clothes are fastened more firmly on them than on small ones. Where children fasten their own clothes, they can do so more easily if the buttons are of a large size.

Little children cannot be good and happy if they are uncomfortably clad. If garments are too large and pull out of place, rubbing the tender skin; or, if too small, and press too tightly into the little forms, it is no wonder that their wearers often become cross and peevish, without even knowing why they are so.

Spring Millinery.

Easter has been called the "Feast of Bonnets," and it is soon after that high festival that the bewitching spring gowns and hats, prepared during the blustering days of March, make gay the city streets. It seems as though the fickle dame, Fashion, would never weary of black, so unusually constant has she been to the somber hue, and we are informed, once more, that black dresses, black trimmings, and black millinery will be the very best form. Certainly, if we can have but one new bonnet during a season, let that be a black one, for then the walking-suit and head-gear can never, as the French say, "swear at one another." For true elegance one must have a costume that matches throughout and bespeaks care in details.

Cloth bonnets and toques are extremely fashionable, and the only difference between them is that one has narrow velvet strings coming from the back and tying beneath the chin, and the other has not. Over a long toque frame, the smooth-faced cloth is laid in soft folds, while the brim is formed of rather flat flowers, arranged so that the leaves rest lightly on the hair. Rosés are, perhaps, the best suited for this, and the most *chic* of all are the unnatural but stylish green roses fashioned of velvet or satin. As ever in the glad spring time, lavender, violet, and mauve are much in vogue, and the cloth capotes, made of these dainty tints, are truly lovely with a garniture of lilacs, pansies, or the deep Russian violets. The ties are of purple velvet, so dark that, in the shade, they appear almost black. Serviceable little straw toques that young ladies choose for best in the spring, and second-best throughout the summer, are of English or Milan braids. The crown is draped with velvet, and two wings are placed low on one side, together with a graceful aigrette of glittering jet. A more dressy way is to cover the top smoothly with black Chantilly lace, twine folds of velvet along the sides, and pose a butterfly of lace directly in front. Indeed, black lace and Brussels net figure largely among all the fresh importations of French millinery, both as trimming and in forming the entire hat, and lace bonnets, toques, and large round hats will be worn by women of all ages. They are decorated with flowers, jet, or wide lace barbes pleated in close fan-pleats, and wired to stand upright in butterfly bows.

In all variety of straws, chip, and the transparent Neapolitan braids, the small English toque divides favor with the picturesque Spanish toreador hat; while there are other large, round hats, having low crowns and wide, projecting brims. The perennial Leghorn flats have also appeared again, and will, as usual, have their reign at midsummer, and be worn by those country lassies who agree with the old writer that "from the highest to the lowest there is not a single style of beauty with which the plain straw hat is not upon the best understanding. It refines the homeliest, and composes the wildest. It gives the coquettish young lady a little dash of demureness, and the demure one a slight touch of coquetry. It makes the blooming beauty look more fresh, and the pale one more interesting. It makes the plain woman look at all events a lady, and the lady more ladylike." High praise this; so let us all cherish our plain Leghorn flats. As its opposite, however, is shown a curious little capote with an open crown, which leaves the top of the head uncovered—a fashion which was introduced for theater-bonnets during the winter.

Floral wreaths, half-wreaths, and clusters are the most favored trimmings, while with them, or else alone, are used great quantities of maiden-hair fern; the graceful fronds sometimes forming the entire facing of a black net hat, and mingling with the ribbon bows and ostrich plumes on the crown. Flowers and feathers are often used together on large round hats, a garland of crushed roses, without foliage, encircling the back, while a bunch of black tips nod in front. Gay red-and-yellow poppies, marigolds, and buttercups, appear on the rather gorgeous Spanish hats; while modest little bonnets have delicate wreaths of blue forget-me-nots, primroses, or ragged petalled chrysanthemums. If flowers are not desired, an Alsatian bow of velvet or rich ribbon is quite as smart. As this makes the face look broader, however, the woman of a plump countenance should not venture upon it. As the season advances, bonnets of crêpe drawn on fine wires will be popular, and gauze ribbons, lisse and silk muslin pleatings will be used for garnitures. Plaid ribbons are liked on children's hats, but nowhere else; while gold, fancy braids, embroidery, and passementerie may be applied with a lavish hand wherever fancy dictates, or they may chance to look well.

With most of the spring hats veils are worn, the newest of which are of *point d'esprit* net, with narrow, short points on the edge. A more showy style of veiling displays large black dots placed far apart on either white or black tulle. These have the effect of "patches."

Economy in the Kitchen.

MRS. M. HOWARD.

Breakfast, especially on the farm, should be *the* meal, *par excellence*. Yet how many housekeepers hesitate about getting such and such things, thinking they will not be appropriate, or will not go well together. And how many think "Oh, anything will do for breakfast." But it should be the pride and delight of every housekeeper to have a good breakfast; and one with skill can prepare quite a feast in a short time, and with few materials; it really takes skill to do it, but skill can be acquired.

After the table is cleared away, dishes washed, ashes removed, the sweeping done, beds made up while the dust settles, and numerous other things accomplished, the mind turns to dinner. And what shall we have for dinner? Suppose we had boiled ham for yesterday's dinner, and a little was left—mostly fat, as is usually the case; we must invent some way to use it, for we are running the house economically. We can either make a hash, by chopping it very fine with potatoes, mixing it thoroughly, and seasoning it well; or, we can make ham-balls by chopping it fine and adding an egg for each person and a little flour; beat together, make into balls, and fry brown in hot butter.

Another way to get rid of scraps of ham: Melt a piece of butter in a stewpan until it is slightly browned. Beat one egg and add to it, then put in the ham, finely minced; add as much water as will make it moist, stirring it quickly, and pour it on some buttered toast. This makes an excellent breakfast dish.

If scraps of beef are left, a delicious hash can be made by chopping fine and seasoning well with salt and pepper. To one-third of meat add two-thirds of chopped cold boiled potatoes, with one onion chopped very fine (or the onion can be left out). Place in a shallow pan, dredge with a little flour, and pour in at the side of the pan enough water to come up level with the hash; place in the oven, and do not stir it. When the flour is a nice brown and has formed a crust, take out, add a lump of butter, stir it through and serve immediately. Beef-balls can also be made the same as ham-balls.

Every scrap of meat should be saved, for such pieces are often handy when the perplexed housewife wonders what to get next, and wishes to be as saving as possible. There is often great waste in the kitchen by those who say they try hard to economize. In cooking meat the water is often thrown out without removing the grease. Scraps of meat are thrown away because "only a little is left, so there's no use in saving it." Dried fruits are not looked after, and become wormy. Cream is left to mold and spoil. The tea and coffee canisters are left open, thereby losing the strength of their contents. Bones of meat are thrown out, when they could be used in making soup. Sugar, tea, coffee, and rice are spilled in careless handling. Soap is left to waste in the water, tubs are left to fall to pieces, brooms and mops are not hung up. How much is wasted by some housewives in these seemingly small things! Yet these small things amount to considerable.

BOYS & GIRLS

The Baker Boys' Holiday.

AGNES CARR SAGE.

Up to nearly the close of the last century, the houses, manners, and customs of Holland still lingered in certain portions of the city of New York. Dutch costumes might be seen in the streets, the Dutch tongue was chiefly spoken at the Bear (the present Washington) Market; and vessels were oftener advertised as bound for Amsterdam and Rotterdam than for Liverpool and London, while the great Dutch festivals of Paas (Easter) and Pinkster (Whitsuntide) still flourished with much of their pristine glory.

It must have been about the year 1795 that, one Saturday morning in the month of April, two apprentice boys of some sixteen years of age were paddling about in a huge wooden tray, kneading with their bare feet (which, thanks to the good Vrouw Van Bommel, were as white and clean as soap and water could make them) a great batch of bread to be baked for Sunday; while the worthy owner of the bake-house, little Boss Van Bommel, was flying about, in a snowy cap and apron, drawing from the spacious brick oven the hot rolls and muffins, fragrant pies, and crisp cookies for which his tidy little shop was famous among all the Dutch, English, and French of Manhattan Island.

"Think you, Hans, that fair weather we shall have for our holiday?" asked the shorter and stouter of the youths as he paused to rest, leaning against the side of the trough and digging one big toe into the soft dough.

"Ya, Claus Spreigle, I think it," replied Hans Vanderveen, peering out of the little bake-house window. "To the west does the weather-cock turn

"GOOD MORROW TO YOU, SANDY."

his beak, and in the blue sky float big hillocks of white cloud. Favorable signs are those, the old sea-captain says."

"Good! And how much of your earnings have you saved against Paas, Hans? Fifteen bright solid dollars have I, and, mayhap, not a copper penny will remain by Monday night, for fine doings I hear there will be in the market-place and at the Bayard farm."

"So! Well, ready am I for them," laughed Hans, "for 't is twenty whole dollars that jingle in my purse. Know you, Claus, if the Ganzevoorts from Pavonia will be coming over?"

"Aye, surely,—Pieter and Flip, and Janneken, and the little Blandina, besides many more boys and girls from Hoboken, and Flatbush, and Hackensack."

"Ach! but a glorious festival will it be!" exclaimed Hans, his long, narrow face, with its high cheek bones, all aglow.

At that moment, however, there came a loud call from Baker Van Bommel of "Poys, poys, pring dat pread dis instant moment!" And so the conversation ended as the apprentices, with a cheerful "Ya, ya, Boss!" shouldered the big tray, and five minutes later were up to their elbows in flour, as they molded the smooth loaves and set them to rise.

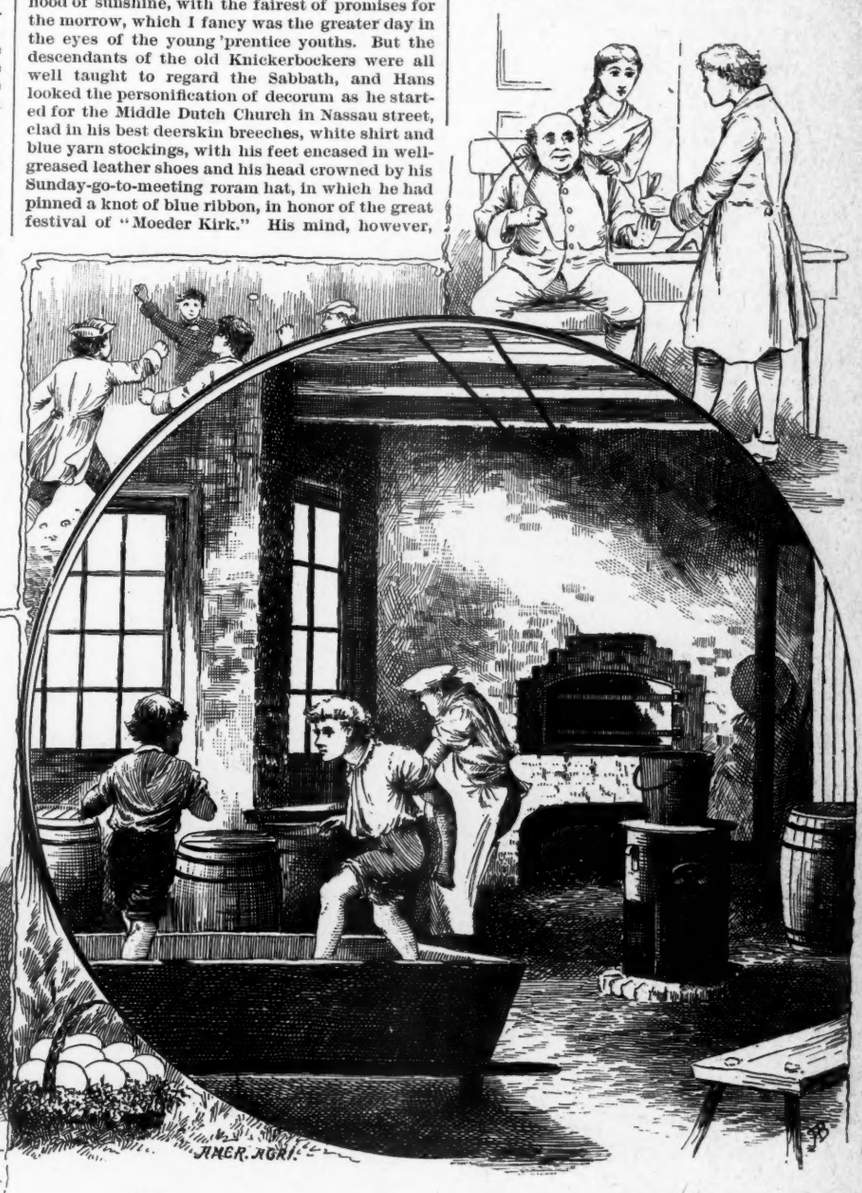
Sure enough, Easter Sunday dawned and set in a flood of sunshine, with the fairest of promises for the morrow, which I fancy was the greater day in the eyes of the young 'prentice youths. But the descendants of the old Knickerbockers were all well taught to regard the Sabbath, and Hans looked the personification of decorum as he started for the Middle Dutch Church in Nassau street, clad in his best deerskin breeches, white shirt and blue yarn stockings, with his feet encased in well-greased leather shoes and his head crowned by his Sunday-go-to-meeting roram hat, in which he had pinned a knot of blue ribbon, in honor of the great festival of "Moeder Kirk." His mind, however, was full of the Paas Monday festivities, and he was just wondering what luck he should have at the egg-cracking, when, near the Tea-water pump, he ran against an old Scotch cobbler, with whom he occasionally exchanged a pleasant word, and paused to nod and call, "Good morrow to you, Sandy, and a joyful Paas!"

The aged man set down the pail he had brought to fill and looked up with a sigh. "I thank you, laddie," he said, "but there is nae joy in the warld for me this day. The gudewife greets at hame for fear that to-morrow we be turned into the cauld streets an' noowhere to lay us doon to sleep."

"Is it so! But how comes that?" asked Hans, sympathetically.

"Aye, weel! 'Tis all alang o' having a hard-hearted landlord, who threatens to administer the law on us for a wee matter o' five dollars rent, while, in so sair a strait are we, through sickness and lack o' cobbling, that it might as weel be five hundred. 'Tis a bitter drap, lad, for all my life lang hae I held my noddle high and ne'er thought the auld wife and I should coom to the almshouse and potter's field at last; but sae it looks noo," and the old man sadly wiped away a tear.

Kind-hearted Hans was touched, and instinctively his hand went to his pocket, while in another moment he had counted out five shining dollars and was offering them to the unfortunate cobbler.



KNEADING BREAD IN THE BAKE-HOUSE.

Eagerly the Scotchman seized the money, but then a flush overspread his rugged countenance, and he handed it back, saying: "Noo, noo, Hans. Put up your siller, though you are mair than kind and show you hae a gude heart o' your ain. Maist like it were for new kirk-clothes you were saving this, and Sandy McCloud is nae the mon to rob a laddie."

"Foolishness is that you speak!" said the Dutch boy, "and insist I must. 'Twas but for the egg festival these dollars were saved, and more have I left than 't is right to throw away; while how could I pray the good St. Nicholas to send me luck did the necessities of the poor I not regard, on the day the blessed Christus did from the dead arise?"

"A vera Christian observe! Weel, weel, then, if you will hae it so, and may the bonny Paas sun shine on you all the year lang, for your gudeness to a poor auld mon. Mayhap it will ne'er be in my power to repay ye; but one wee bit o' advice will I drap in your ear, and the day was when Sandy McCloud was thought to be unco' canny. Scatter not your earnings on bright eggs and sic trash, but put it in land, laddie, put it in land! There be ground just out o' town, nigh the Collect Spring, selling for fifteen dollars the lot, that I ken will in a few years bring muckle gain to the buyer. There lies a vera gran' future before New York, lad,—a vera gran' future,—and who kens but you may live to see the city up to Greenwich village yet?"

"Not likely is that, Sandy!" laughed Hans.

"Aye, aye, lad, vera like; but if ye would ne'er stand in the strait I do to-day, bury your siller in the ground yonder, and the gude Lord send ye a bountiful harvest."

The old Scotchman spoke with great earnestness, and, as he stood there, with the Easter sun resting on his gray hair and beard, he seemed to the boy like one of the prophets of old, of whom, when a tiny chap, his mother had often read to him from her Holland Bible with the silver clasps.

"My thanks you have, any way," he said, "and your words will I turn over in my mind."

And so he did, over and over again, as he sat beneath the high pulpit and ponderous sounding-board in the old Dutch Church, while the Dominie, in his black silk gown, related the wonderful story of the resurrection, and the sands in the hour-glass, that marked the time of preaching, dropped through, grain by grain. He wondered if it was but a coincidence that the price of the country lots was just what remained of his Paas money, and started in surprise when the clerk rapped with his cane, for the sermon to close, and the good Dominie concluded by saying: "Into the life of every one a morning of resurrection there sometimes comes, a rising of joy, of prosperity, of happiness! But wise must we be, and early, at the very dawn, ready to grasp the good offered us of God, ere from our sight away it vanishes forever."

All through the remainder of that Easter Sunday, and even in his dreams at night, the old Scotchman's words rang in his ears: "Put it in land, laddie, put it in land."

"Up, up, Hans! Paas Monday is it, and our full of frolic we must have the day!" called Claus Spreigle, early the next morning, as he treated his comrade to a vigorous shake.

"Whish there, then!" grunted Hans, turning over. "Not so keen for sport am I as once I was, and time is it, I think, that such foolishness we left off, and like men began to act."

"Donders! Whatever aileth thee, boy?" asked Claus, suspending his toilet and gazing at his friend in open-mouthed astonishment. "Not keep the Paas festival! Is it sick thou art, or has thy wisdom-tooth sprouted in the night? Why, 'twas but Saturday last that fierce enough wast thou for the egg-cracking and dancing!"

"True is that. But yestermorn a sensible hint had I, and with you will I share it, Claus," and Hans, who must have inherited a considerable portion of the forethought and prudence for which his Dutch ancestors were proverbial, proceeded to tell his companion of the old Scotchman's advice and of the cheap land selling near the Collect Spring. But Claus was too intent on his day's fun to give the idea a thought.

"A fico," he cried, "for such foolish talk as that! Rather would I have my frolic now than a few more jacobuses in my strong-box, when deaf and blind and hobbling on a stick am I. 'A bird that is caught in the hand is worth two that in the tree-tops fly.' So be not a silly splutterkin, but come and enjoy thyself."

Now, Hans Vanderveen was as fun-loving a boy as ever cracked a Paas egg or squandered his pennies on New-Year cookies, while he was the best ball-player in the Meadows; but somehow, to-day, the ghost of that wise, discreet Holland grandfather of his seemed to clutch tight hold of his purse-strings, while a bit of Dutch stubbornness rose up within him and revolted against Claus's sneering words. So, although he accompanied his friend to the Bear Market, he took but a shilling in his pocket, while the fifteen dollars remained safe and snug at home.

Truly, the rude place of traffic on the North river was a goodly sight on that Easter Monday, decked with gay streamers of blue and orange, while the tidiest of market-women, from Hackensack and Hoboken and Communipaw, displayed on their neat little stalls the most tempting of cheese-cakes, olykoecks and krullers, gilt gingerbread in a dozen fantastic shapes, bunches of sweet spring blossoms, and pyramids of bright-hued eggs that reproduced every tint known to the artist's palette. To the squeaking of fiddles and tooting of horns gaudily clad negroes were dancing, and hosts of boys stood about laughing, joking, cracking eggs, munching sweeties, or playing at pitch-and-toss.

"Not long will your foolish determination hold out here!" whispered Claus in Hans's ear, as a bevy of lads came flocking round them crying: "So! Is it you, Hans and Claus! Good! You we want to join in a big egg-battle on the Parade. Fifty eggs apiece the allowance is, and at the end whoever the most shells has captured he it is will be the Paas-Day King. Say, will you come?"

"Aye, with all my heart, for rare sport will it be!" answered Claus; but Hans shook his head. "In such a frolic I care not to take a hand to-day," he said.

"But why and wherefore?" asked Flip Ganzevoort.

"Because the eggs he will not buy," said Claus. "His money the splutterkin wants to save and bury in the Collect swamp."

"Thy tongue can'st thou not hold?" muttered Hans, under his breath.

"Gunst! Whatever mean you?" asked Flip.

"Only that in his bonnet a bee is buzzing, as his Scotch friend would say," continued Claus. Then, in a lower tone, "Come, Hans, very queer will the boys think it if you do not join, and the price of fifty eggs will I lend you. The girls, too, they will laugh, and see—here come a whole troop from Pavonia now with Blandina Ganzevoort leading the way, and pretty as a *Pinkster blumie* does she look!"

It was a very lively, chattering party that now approached, but none had so sweet a voice or merry a laugh as one flaxen-haired, fifteen-year-old maiden, in the gayest of quilted skirts and trimmest of bodices, who danced up to Hans, saying, "Good day, Mynheer Vanderveen, and with me are you ready to crack an egg?"

Before the boy could reply the other youths shouted, "No, no, Blandina, ask him not. The Patroon van Collect is he to be, and Paas-Day sports he now does scorn."

"But surely a good old custom thou would'st not break?" asked the girl, opening her blue eyes in surprise.

"Nay, jufvrouw, but for the egg-cracking I do not care. Instead, a Paas posy may I not offer thee?" and he beckoned to a woman, bearing a basket of flowers, determined to expend his one shilling in a bunch of violets.

"No, I thank you, Mynheer," said Blandina, scornfully. "From such a stingy splutterkin nothing would I take," and with a pout she turned away and was soon clashing eggs gayly with the other boys and girls, while Hans felt his cheeks burn and his heart beat painfully as he wondered if any future good could repay him for to-day's sacrifices.

It was rather a moody youth, then, that followed the Paas warriors to the scene of conflict, and sat alone on the edge of the Parade, while the battle waxed and waned, egg smashed egg, covering the fresh grass of our present Bowling Green with shells of many colors, and the cries of the victors echoed to the extreme end of the Battery, and floated out over the blue bay. And he certainly felt a bitter throb of jealousy and regret when, the fight over, Claus—mocking Claus—was declared the Paas-Day King, and Blandina, taking a bow of blue and orange ribbon from her dress, pinned it on his breast and then went merrily off with him to dance at the Bayard farm in the Bowery.

"Well, whatever betides, all the fun I will not lose!" thought Hans. So he followed after with Katrinchee Boomptie, who was quiet and sedate, and did not bother him with troublesome whys and wherefores as to the reason of his conduct, which seemed so strange to the frolic-loving Dutch lads and lasses. And, with Janneken Ganzevoort and Gretchen Rapeljie from Brooklyn, he joined in the reels and cotillions on the green, though his eyes often followed a certain little scarlet petticoat and black bodice, that whisked about as though their owner had wings on her silver-buckled shoes, while he frequently found himself listening to catch the words that tripped so lightly from one saucy little tongue.

"Well, glad am I that this day to its forefathers has gone," he thought, as he tumbled into his feather-bed that night, but he lay awake long after weary Claus was rousing the echoes with his inharmonious snores.

On Easter Tuesday, however, the youth had a slight reward, when, having begged a few hours' leave of absence from cheery little Boss Van Bommel, he took a trip out of town to look at the ground of which the cobbler had told him, interviewed the owner, and paid down his fifteen dollars; while he felt that he had taken one step up the ladder of fortune when, several days later, he locked up the title of his lot in his strong box and realized that he was a landed proprietor, to a small amount, at least.

For five years longer, Hans as well as Claus worked day by day in the little bake-house, kneading, baking, and serving customers, while, each spring, Paas and Pinkster were kept up with less and less enthusiasm. At length, one fine evening, the term of apprenticeship came to an end and the two stalwart young men of twenty-one were summoned into the parlor behind the shop, where they found good Vrouw Van Bommel, in her best cap, setting forth rich plum-cake and spiced ale on the table, while presently in bustled the worthy baker, bearing a couple of fine beaver hats, one of which he presented to each, together with his "freedom." Then followed such a shaking of hands and drinking of healths as is rarely seen between master and employees.

"And now," said Mynheer Van Bommel, "I vill say, dat novare in all de city can pe found petter bakers dan you poys, and if vith me you vants to stay, glad shall I pe and good vages vill I pay."

"Thank you, Boss," said Claus, "and most willingly will I remain, for few jacobuses have I, and such a situation is not to be sneezed at."

"Then will not I," said Hans, "for a boss do I wish to be, myself. At Greenwich it will be that a bake-house I shall, on my own account, set up."

"Wat blixum!" ejaculated Claus, while Mynheer Van Bommel asked, "But de money, Hans! From vare vill de money come?"

"From the Englishman, Mr. Leonard," replied Hans, "who promises me to pay three thousand dollars for my lot on the edge of the town."

"The egg-money land?" asked Claus, his china-blue eyes almost popping out in astonishment.

"Ya, ya, comrade. It is the same!" And surely Hans had reason to feel proud, when, the day after attaining his majority, the Englishman willingly paid him what seemed, in his eyes, a veritable fortune. "A canny old Scotchman, indeed, was Cobbler Sandy!" he thought, as he left the lawyer's office with the money in his pocket.

Just outside the office he encountered Katrinchee Boomptie, who asked, "Have you heard, Hans, of the trouble that has befallen the Ganzevoorts of Pavonia?"

"Ach, no! What is that?"

"Why, like to lose his home is Mynheer, because one thousand dollars he cannot raise, and full of sorrow are Janneken and Blandina."

"So! A pity is that!" said Hans.

An hour later he stood on the Jersey shore and was making his way to the Ganzevoort farm, where he soon brought back the sunshine to a pair of sad blue eyes, and set three hundred pounds of jolly Dutch farmer to puffing at his pipe of "Virginia" in restored peace and contentment.

The lads and lasses of Greenwich village, in the early part of the present century, often declared that nowhere could such delicious krullers, cheese-cakes, and New Year cookies be found as at the "Paas Bakery," as it was called.

Hans and his pretty wife, Blandina, lived to see New York, true to the old cobbler's propheey, come creeping up to their very door. Prudent and thrifty, in time the shop was given up and all their savings invested in land, which doubled and trebled in value, over and over again, and their sons and daughters began to hold their heads very much above the children of the poor under-baker Claus Spreigle, though, to Hans's credit be it said, he never forgot his old comrade.

Nearly a hundred years have rolled away since the spring merry-making in the old Bear Market, and with them almost the remembrance of the ancient Dutch festivals; but occasionally, on some bright Easter morning, a wealthy, high-bred Vanderveen will take his little ones for a walk down to Leonard street, and, as they gaze at the great wholesale stores and warehouses which now line that thoroughfare, will tell them that it was in that vicinity that their ancestor, Baker Hans, invested his Paas money, and laid the foundation of the family fortunes.

Three Nice Prizes.

For the three best lists of answers to the puzzles published below we offer three very attractive prizes, all of which will be forwarded to the winners, post-paid:

First, for the best list, half a dozen table-spoons and a dozen tea-spoons, all of Rogers' extra silver-plated ware, silver-plated twenty per cent heavier than the regular standard plate. The same number and grade of spoons cannot be purchased at any store for less than five dollars.

Second, for the next best list, one Rochester magic lantern with forty views, descriptive lecture and tickets. This lantern will enable any boy or girl to give a nice entertainment to a party of friends, and, by charging a small admission fee, make a snug sum of money. The regular retail price of the lantern is three dollars, and we know of none other so good at that price.

Third, for the third best list, a French achromatic telescope, with five lenses, brass slides, brass safety-caps, and morocco-covered tubes. It is six inches long when closed and sixteen and one-half inches long when open. By its aid you can distinctly see cattle or sheep that are miles away.

Puzzle-answers must be mailed to "Puzzle Editor, AMERICAN AGRICULTURIST, 751 Broadway, New York," on or before the 20th of this month. All contestants are particularly requested to read the replies published below in response to numerous inquiries. Please study them carefully, and thus avoid any possible misunderstanding.

29. TRANSPOSITION.

Complete, I mean attire;
Transpose, I mean to clutch;
Transpose again, and I express
A game that some like much.

30. GEOGRAPHICAL REBUS.

SCC.

31. ANAGRAM.

Ed sold a tonic. (The answer is one word.)

32. LONG DIVISION.

In the following example, letters are used for figures according to a fixed plan. For instance, if the letter S stands for the figure 9 in one place, it stands for the same figure in every other place. Each letter represents one digit, and only one, and it will be found that all of the ten digits are represented. Required, to give the word represented by the digits (as here used) when they are placed in the following order: 1, 2, 3, 4, 5, 6, 7, 8, 9, 0. Also, required, to state in figures the mathematical answer to the problem. Of course, the first thing to do is to find what digit is represented by each of the ten letters that are used.

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A N)N I S G W U(A I W H S
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    ---
    W S S
    W S B
    -----
        S G
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        W W W
        W B H
        -----
            G U
            G T
            ---
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33. WORD SQUARE.

1, a small portion of land; 2, an agreeable expression; 3, a hard-twisted thread; 4, a girl's name; 5, a portion of one's life.

34. DROP-LETTER PUZZLE.

—i—i—i—e. (One word.)

35. RIDDLE.

What travels miles o'er hill, or dale, or plain,
Which if one tries to stop, he tries in vain?
'Tis almost deafening with its awful noise,
Yet is delighted in, at least by boys.

36. THE PUZZLERS' LIBRARY.

The following are standard works by standard authors:

1. Two ivories missing from the backgammon board.
2. The same found.
3. A poor apple.
4. The music-book of the stable.
5. A hackman rented.
6. The artist's companion.
7. Stuck in a snowdrift.
8. Jennie Atmosphere.

WINNERS OF THE FEBRUARY PRIZES.

The February prizes are awarded as follows: The first prize, worth five dollars, to M. G. McKee, State College, Pa.; the second prize, worth three dollars, to Clara P. Barbour, 322 West Monroe street, Jacksonville, Fla.; the third prize, worth two dollars, to Lillian A. Fay, Nanuet, N. Y.

QUESTIONS ANSWERED.

Each month we offer three prizes—no more. We do *not* offer a prize to every one who sends in a perfect list of answers.

To explain the different kinds of puzzles would take too much space. If you do not understand how any particular puzzle is to be solved, watch for the answer, and, when it is published, compare it with the puzzle. Then you can easily study out what was intended to be done.

In no case have we offered a prize for an answer to only one puzzle.

We cannot answer puzzle inquiries by mail, as that would be giving some an unfair advantage over others.

The names of the prize-winners are announced as promptly as possible. We cannot publish them in the next number, as that number goes to press before the puzzle-answers are all received from the more distant contestants.

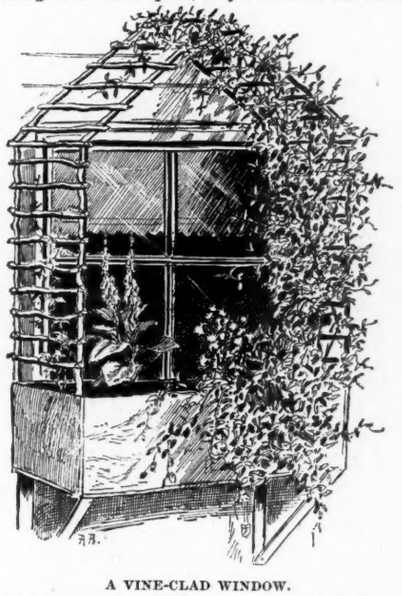
In order that far-away contestants may have a fair chance, we have extended the time for answering until the 20th of the month. This does not mean that the letters must reach us by the 20th, but that they must be mailed on or before the 20th.

The answers to the March puzzles will appear in the May number, along with the names of the winners of the March prizes.

The interest in this department, shown by the hundreds of letters which we receive every month, is extremely gratifying. All cannot secure prizes, but all who work hard enough can enjoy the pleasure of solving the puzzles.

Rustic Window-Box.

The accompanying illustration of a window-box with a canopy, or roof, will give the boys an idea of what they can construct with but little trouble, in the proper season; and in making it, or something on the same plan, they will have the satisfaction of knowing that they are doing something that will afford pleasure to mothers or sisters, as well as themselves, and that will add to the attractiveness of home. We like to get the boys interested in work of this sort, for it seems to give them a kind of partnership in the home-making business.



A VINE-CLAD WINDOW.

The canopy, or roof, can be constructed of rough sticks with the bark left on, if you want something that will give a very pleasing rustic effect. The cross-strips can be fastened in place with wires. The rougher and knottier the sticks which are used in the construction of this part of the box, the more satisfactory the effect, for, during the earlier part of the season, it will not be covered. After the vines get large enough to hide the frame-work, no one will know what it is made of. Therefore, if such material is not at hand, any kind of strips can be used. Lath will answer very well, or strips can be split from boards. If your strips are made smooth and even, and you happen to have some paint at hand, give them a coat of it. This will make them less conspicuous, if it happens to be a color which harmonizes with the color of the house. But don't use any that is of a glaring color, for it will only serve to make your frame-work more noticeable. The illustration shows a canopy suitable in height for a low window. Of course it can be made to fit a window of any size. It will be found much prettier than any cloth awning, and quite as effective in furnishing shade.

The Old Game of Hop-Scotch.

HENRY D. TAYLOR.

With the advent of spring come the children's out-door games just as surely as the grass. As I was walking down street, the other day, I saw two youngsters trying to mark out a game of hop-scotch. Neither of them knew just how to do so, and, as I came up, one of them said, "Mister, can you make a hop-scotch for us?" Fortunately I did know how, and I marked it out for them. As I passed down the street I could not help wondering how many of the boys and girls of to-day know how to lay out the diagram for the game, and how it is played. All that is necessary is to mark out a plan like the accompanying diagram, and have a small flat stone, called a "scot." The one beginning the game stands in front of the place marked 1, and throws the scot into that number. He must then hop into the space, and kick the stone out with the foot upon which he is standing. If, in throwing in the stone, it rolls upon a line, or into another square, or if, in kicking it, he gets his foot upon a line, or if he kicks it out at one side of the diagram, he is "out," and another player tries his chance. If, however, he succeeds in getting the scot out of No. 1, he then tries No. 2 in the same way, and so on until he misses. In entering the game, he must put a foot in each space. Thus, when he gets up to 13, he must hop into every space, in order, before he hops into the one where his scot has been thrown. If he chooses, he can hop into 1, then into 2, then put one foot into 3 and the other into 4, thus giving him a chance to rest; then hop into 5, put a foot into 6 and 7, hop into 8, put a foot into 9 and 10; then jump to 11 and 12, then hop into 13, and begin to kick out the scot. When he begins to kick the scot, he cannot put the other foot down until he has kicked the scot out of the game or made a mistake, as before stated. He can kick it as far as he likes at one kick, and from the larger spaces it is quite easy to send it out of the game with one kick, while in the smaller ones it requires some skill to get it out without touching a line either with the scot or the foot. If the game is played by very little folks, it is a good plan to have the triangular spaces the middle of the game, leaving out from 9 to 17 inclusive, bringing 18, 19, 20, and 21 close up to 8. This makes a shorter and easier game, and is about as long as the little ones care to hold up one foot; but for the larger children the whole diagram should be used.

THE DIAGRAM.

FROM NEAR AND FAR.

Agricultural Education in Sweden.

In Sweden there is no Agricultural Government Department, but they have what is known as the Royal Agricultural Academy, consisting of, as I believe, twenty-four members, all of them honorary, receiving no compensation for services rendered. This body elects a secretary, who is salaried, and who may be called the "head" of all agricultural matters. The Riksdag, that is the parliament, votes annually a certain amount of money to this academy, the distribution of which lies with its board. In different parts of Sweden this academy has established special experimental farms,—that is, one farm makes a specialty of gardening, and another a specialty of fruit-growing, another makes a specialty of seed-production, and still another of horses and cattle. These agricultural stations are supported by the moneys appropriated by the Riksdag. The Royal Agricultural Academy has charge of all the higher agricultural education of Sweden, and for this purpose receives pupils who must, however, be university graduates.

In each Province there is a Royal Agricultural Society, to which the members are elected by the communities. These societies correspond somewhat to our State agricultural societies, were we to elect the members of those societies from the counties in the State. These provincial societies are for the most part supported by voluntary contributions, they also receive financial aid through the intervention of the secretary of the Academy, and also in extraordinary cases directly from the Riksdag, and for such purposes as purchasing thoroughbred animals for breeding purposes, extensive drainage, forest clearing, etc. Each provincial society carries on an experimental farm of its own, the manager and head-teacher of which however is always appointed by the Royal Agricultural Academy. These provincial experimental farms are also used as colleges, at which a pupil spends two years, and being duly examined, is graduated and becomes eligible as foreman or manager of a private farm. One important branch of the agricultural education at these farms is the dairy instruction, which is under the supervision of a thoroughly competent teacher, always appointed subject to the approval of the Royal Academy.

At the Royal Academy several classes of agricultural engineers are prepared; after passing their examination, these are drafted out as provincial engineers, or dairy instructors, or managers and teachers of provincial colleges, drawing a salary indirectly from the State through the provincial societies. The duty of these, whether agricultural engineer or dairy instructor, is to visit any farm or dairy on application by the owner and give any advice desired, free of charge, except repayment of traveling expenses. By this system, the Swedish government has endeavored, and with most marked success, to get the general knowledge of agricultural theories and practice diffused among the entire agricultural population. And still the government has not stopped here, but, having done everything possible to improve the agricultural production of the country, assists the farmer still further;—it assists the farmer even to the market and foreign trade. For instance, the Swedish government has two permanent representatives in England whose sole duty is to keep thoroughly informed as to the wants of the English market, so far as it concerns the products of Sweden exported to that country. They watch the fish-market, the grain, cattle and dairy market, and to a certain extent act as inspectors of fish and dairy products exported, and all other Swedish products coming to that market. The presence of these inspectors in England has been of great benefit to the Swedish exporter, inasmuch as he is also a great assistance in the matter of selling. I need not say more than affirm my sincere belief that the Swedish people have to thank this system alone for raising their agriculture from a deplorable state less than twenty years ago to a state comparable with, if not superior to, that in any part of Europe.

F. K. MORELAND.

The Timber Question in Arizona.

No part of Secretary Rusk's annual report possesses more interest to residents of Arizona than his remarks upon the timber question. He strongly recommends that Congress shall amend the laws so as to bring the timber thieves to a sudden and final halt. They are cutting and destroying timber in Arizona in a manner which is disgraceful. The damage is incalculable, and cannot be repaired in years, if ever. I hope the Senate and House will act promptly on the Secretary's recommendations. The question is not a political one, but is of vital importance to the country. Not only should the timber already growing be protected, but effective provision should be made for planting and rearing trees throughout the West. If Australia can foster tree-planting on her plains and mesas, surely we can. More trees mean more homes throughout the treeless regions of our country.

S. G. TURNER, Walker, Yavapai Co., Arizona.

A Little Country Home in Tennessee.

The possibilities of agriculture, as affording opportunities for men of small means to make comfortable homes for themselves and their families, and to escape the restraints that they must inevitably labor under, as mere hired workmen in the various avenues of industry, was finely illustrated by a recent visit to a small fruit-farm in Western Tennessee.

The farm consisted of sixteen acres of good land. It was clean and well fenced, had a comfortable frame cottage of five rooms, and a small stable, and shed for fruit-packing. Upon this little farm is grown almost every fruit that the soil and climate of Tennessee can produce, and that means the majority of such as are indigenous within the temperate zone. There was a thrifty young apple orchard; there were peaches, plums, apricots, pears, quinces, cherries, grapes, blackberries, raspberries, strawberries. Of these, the latter were as yet the main market crop, for the reason that it had been possible to get them under cultivation and upon a paying basis earlier than the other fruits.

Three acres of the best market varieties were shown. The rows were full, runners kept in check, and the plants looked green and thrifty. The farm had been but a few years under cultivation, and most of the orchard fruits were but just coming into bearing. Yet the owner's books showed that his net sales of produce had been above eight hundred dollars during the past year. Under the system that was being pursued, the income would doubtless augment with succeeding years. Besides this, a good garden—the cellar being well stored with its products, for winter use—had done much toward supplying the table, and so reducing the expenses of maintenance.

These few acres had been purchased—partly on credit—for a couple of hundred dollars. A roof sufficient for shelter had been erected and made to answer during the "day of small things," and had been added to as circumstances permitted. This man had been a blacksmith, working in a large town, where rents and the necessaries of life were high. He had, after long debate, summoned up courage to make what was practically a new start in life, and the result had been most happy. Upon this little property the owner put, at the time of my visit, the moderate estimate of $1,600. It was free from incumbrance, and I have no doubt that sum could readily have been obtained for it.

In the light work of cultivating, gathering, and packing the fruit, the owner was assisted by wife and children. In this occupation all were growing healthy and strong, whereas the doctor had before been a frequent and expensive visitor. The family was better housed, better fed, and better clothed than had been possible under previous conditions, and within a few years they had succeeded in securing to themselves a home such as they could hardly have accomplished within a lifetime in the city.

If such an object-lesson as this could be placed bodily before the overcrowded and overworked artisans of our industrial centers, it should and might do much toward relieving what Edward Everett Hale has aptly termed "the congestion of the cities."

K. R. FRANKLIN, Western Tennessee.

Razor-Back Pigs in Florida.

I notice in a recent issue of the AMERICAN AGRICULTURIST an account of the Tennessee razor-back, his sagacity and propensity for getting into mischief. I think our Florida variety of the razor-back can beat his Tennessee brother in cunning and sagacity, and is no whit behind in lawlessness. The Florida hogs go in herds. When a rail-fence stands in their way, one of the animals stands up against it, while another mounts his back and goes over. He then turns around and thrusts his snout under his side of the fence, while a big fellow of the herd joins him from the other, and the two lift the fence, while the rest march under. When once inside of an enclosure, it is exceedingly difficult to get them out, for they will run past an open gate or a gap in the fence a hundred times without seeing it, if they do not want to get out.

Our orange groves offer a constant temptation to them, and stimulant to their predatory ingenuity. They enter them only at night, going through, over, or under any kind of fence. When they have helped themselves to all the oranges they can reach from the ground, one of the pigs climbs to his mother's back, and from this standpoint picks and drops for the rest of the herd. Then a smaller pig mounts the back of the first one, and clears the oranges from still higher limbs. In some cases, as many oranges as would fill two or three boxes are destroyed in this way on a single tree. If any one thinks these statements are exaggerated, they can be verified by plenty of eye-witnesses.

R. F. RIGDON, Putnam Co., Florida.

The Situation in South Dakota.

The year 1889 proved to be an eventful one for the Dakotas. The admission of the Territories as States gives what we have long prayed for—self-government and a voice in national legislation. The prohibition plank was adopted by over six thousand majority.

The exceptional drought of the season of 1889 will long be remembered. I have lived in South Dakota eight years, and never saw anything like it. In various parts of the State seasonable showers produced good crops—from fifteen to twenty-five bushels of wheat, good corn everywhere, and fair potatoes. I estimate that, on an average, three-fourths of the State did not produce more wheat than enough for bread and seed. Thus, the farmers of the drought-stricken districts are compelled to depend on borrowed money for feed and necessary expenses another year. Chattel mortgages, at two or three per cent a month, make it hard on thousands of the tillers of the soil. A great many will be obliged to have assistance from their counties, in order to pull through. They are not paupers, but have simply met with unforeseen misfortune. The old settlers are not discouraged, while a few of the later ones have left the State with disgust. At this writing, wheat is sixty-two cents, corn twenty-seven cents, oats twenty-five cents, potatoes fifty cents, beef cattle $2 and $2.15 per 100 pounds live weight. We have had an open winter, and cattle running at large are in beef condition. Horses running out are fat without any grain. Farmers generally are paying more attention to diversified farming, raising some fine grade Percheron, Clyde, and Shire horses, also Holstein, Hereford, and Shorthorn cattle. More corn will be planted in the future and more hogs raised. As dry as last season was, wheat on corn ground went from fifteen to twenty-five bushels per acre, while thousands of acres on plowed wheat-stubble ground did not yield three bushels per acre. Our county has been settled seven years, and it is gratifying to see the many fine farm residences and barns throughout the county. The old sod-shanties and other claim-shacks have disappeared, and the new houses and barns would do credit to any old-settled country. Our villages contain fine business and private residences. The military reservation of Ft. Sisseton, in the eastern part of the county, will soon be thrown open for settlement, as will also a large part of the Sisseton Indian Reservation, bordering on our eastern line. I have given the facts as they exist, and believe that those coming in now and those that hang on will succeed.

GEO. HICKMAN, Marshall Co., South Dakota.

Draining a Connecticut Farm.

During the past thirteen years, I have put in some 12,000 feet of underdrains; of these about 10,000 feet were tile, and the balance stone and plank drains. The land drained was filled with springs, rendering it impossible to drive on some part of it. It was boggy, and produced a light crop of coarse grass, which would not pay the expense of gathering. The fifth crop from a four-acre lot of this drained land yielded thirteen loads of timothy as large as two heavy yoke of cattle could draw, and other crops have been excellent. I bought 2,200 lengths of drain-tile of Jackson

Brothers, Albany; these were superior to the others; but, if drain-tile are porous, I should prefer three feet to thirteen inches as the length for lateral drains, they being more rapidly laid, and less liable to displacement. If I were to drain more of the same kind of land, I should make only plank-drains. The farmer who has timber can avoid expense; the drains are not easily displaced, and are less liable to clog than tile-drains. To construct a plank-drain, the stuff can be sawed an inch and a quarter thick, six inches and seven and a half inches wide, and of any length convenient for handling. These planks are spiked together like the saddle-boards on a roof; holes are bored at intervals; they are then laid, cobble-stones are carefully packed at the sides, and promiscuously thrown on top until the ditch is filled to within twelve or fifteen inches; the stones are covered with leaves, or any coarse material, to keep the earth from them, and the earth thrown out is scraped over the leaves, and the ditch is finished. By using wider plank, a larger outlet can be secured, if desirable. Drains of this kind, in our vicinity, have done good service for fifteen years, and I have reason to think that where the planks are kept constantly wet by running water, the child does not live who will outlast them. I would use these drains only on springy land.

DWIGHT BIDWELL, Hartford Co., Conn.

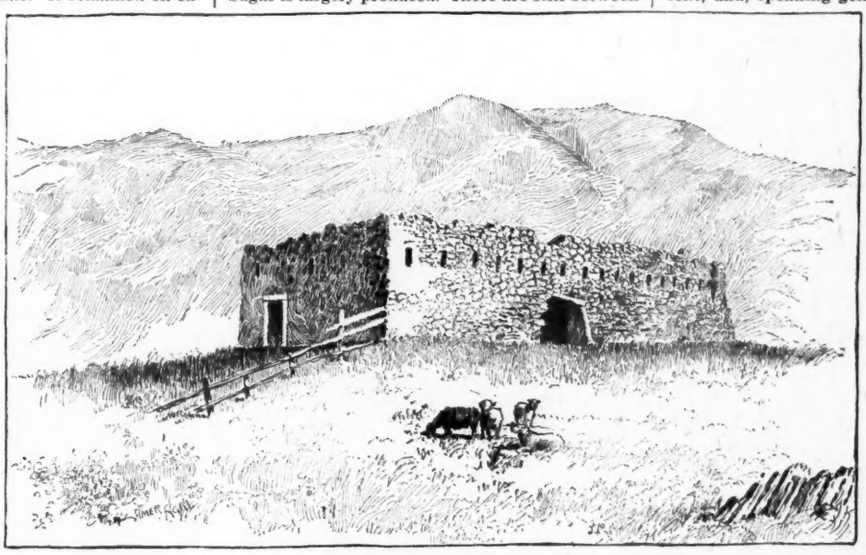
"California on Wheels."

The much-talked-of "California on Wheels" arrived in Los Angeles, Dec. 12, after stopping at San Jose, Santa Rosa, Napa, Sacramento, Stockton, Modesto, Merced, and Fresno. It remained on exhibition a short time, then started on its way to New Orleans, thence to St. Louis, back to Denver (where probably a fresh supply of some things will be sent to meet it), then to St. Paul, Duluth, and Chicago, and on to the Atlantic Coast. It is expected to be gone one year. The train consists of three cars, one the living-car of the attendants, seven in number—two women and five men. Large crowds view the tempting display. The writer entered early, to avoid the crowd. The first thing he saw was a collection of nuts, among them some beautiful almonds (Bidwell Mammoth) from Butte County, but larger and finer ones from other counties. Japanese persimmons were numerous and as big as teacups. Nearly everything of a perishable nature is sealed in alcohol. One jar contains three onions from San Luis Obispo, weighing seven pounds each; another, four pears from Modesto, of five pounds each. As to pears and peaches, nothing is finer than the Bartlett pears and big peaches from Kern Co. Apples are shown as delicious as a man could want, and yet some say "California can't raise apples and corn." The preserved fruits appear very fine in their glass jars. California fruit generally would look the same in the groceries if we could see through the tin cans. The dried fruit deserves special mention. In this respect Los Angeles Co. was thrown in the shade, owing to the small allowance in space and the half-hearted manner in which the Angelenos took hold; and now they are sorry.

Dried figs attract much attention, and many beautiful boxes of black, blue, red, and white ones are displayed, although this is a comparatively new industry. At the present rate it will soon rival the orange. London layer raisins and French prunes are exhibited far richer than the foreign articles. The citrus fruits exhibited consist of oranges, lemons, limes, and citrons. The large number of jars filled with grain will interest many. Possibly some farmers never saw such fine specimens of wheat, Egyptian corn, and other things. The writer never did. It may be asked, Is it because it is California that all these things are so? Yes, partly, but not altogether. It is largely the result of cultivation such as few farmers in the East think of giving, and in part from thinning, which is sometimes done to the extent of two-thirds of the green fruit. In fact, California is no place for a lazy farmer. Other industries are exhibited also. Among them, silk cocoons, raw silk, thread and cloth, cotton in various stages, and in cordage and cloths, fleece of Angora goats in all stages, from the raw to the finished state.

There are onyx from San Luis Obispo Co., marble from Inyo Co., rich minerals from all over the State, fine terra cotta, and many other mineral products to be seen. The cars have large glass windows, and the exhibits are fixed so that many can be viewed, though swiftly, as the train passes. And it is hoped that when it reaches New York the editor will go and see it.

LOUIS LETTELIER, Los Angeles Co., Cal.



OLD MORMON FORT MOAB.

Development in Utah.

Utah is now attracting tourists' attention. The climate is fully equal to the much-extolled one of Colorado. It is quite equable, and the lower altitude (some 3,500 feet) is a positive delight to weak lungs and heart. At Moab, on Grand River, the surveyors of the new railroad—the Denver, Colorado-Cañon, and Pacific—leave every vestige of settlement behind them, and enter the awful cañons of the Colorado. The road is to run from New Castle, Colorado, to Yuma, and will supply Southern California with coal. It is destined to be one of the most remarkable scenic lines in America. The Grand Valley, above the Colorado, is, where watered, a garden-spot. Cotton, corn, tobacco, peanuts, and fruit of all kinds are grown. Sugar is largely produced. There are still between twenty and thirty thousand acres open to settlers. Thousands more acres could be redeemed by capital invested in ditches. The scenery of the Sierra La Sal is of the most wild, romantic, and beautiful character.

In 1849, the Mormons built at Moab the old fort, shown in the engraving, in an unsuccessful attempt to found a colony there. This is the place the Southern Utes last year demanded in exchange for their Colorado reservation.

M. M. RICHARDSON, Utah.

The Wheat Trade of the Pacific Coast.

The remarkable condition of affairs in the grain trade on the Pacific coast during the past winter is worth the attention of all American wheat-producers. There were not enough "ships in sight" to carry away the wheat, and a new season is coming on. Wheat interests here will be seriously affected, beyond a doubt, and even the cheapness of harvesting methods may not be sufficient to save the growers from loss. To give the statistics, there were in California, on the first of December, 500,000 tons of wheat for export. Oregon and Washington also have a large surplus. The entire tonnage of wheat-vessels in port aggregated only about 200,000 tons. The disproportion in the Northern ports is quite as bad, if not worse. Some relief may be had from Australia, perhaps to the extent of 150,000 tons, but this is not certain. Freights have been raised from twenty shillings per ton to thirty-five shillings, and will go higher. The immediate cause of the scarcity of wheat-ships is the development of Pacific coast coal mines, which has destroyed the business of bringing coal here from England. Ships cannot afford to come in ballast until freights go to forty or forty-five shillings a ton. The present wheat-fleet brings some iron, coke, cement, and bulky merchandise to the coast, and the former coal-ships have left the trade forever. If this condition of things continues, it will do more to lessen the acreage of wheat in California than all the inventions of the past few years can possibly do to increase it. The extremely favorable winter that California is having has already turned the thoughts of thousands of wheat-farmers to more diversified products, which can be sent to market by railroad, instead of by sea. Whether or not the railroads can afford to carry wheat to the Atlantic seaboard at a price which will leave the wheat-grower a living profit is one of the problems of the future. Many prominent railrord men think that it can be done. But, at all events, it is evident that the California wheat-farmer has need of all the system and intelligence he can bring to bear on the business. There is money in wheat, even at present prices and freights, for the better type of farmers, but many men have found it hard to make both ends meet this season.

CHARLES H. SHINN, Alameda Co., Cal.

Prosperity in Australia.

We have had in New South Wales the past year one of the most beautiful seasons ever experienced in Australia. The wheat crops are magnificent, and, speaking generally, escaped the rust; where rusted, it was very slight. The hay crop has been a bounteous one; in many places over three tons to the acre have been cut. The fruit crop, however, is not a very good one. It might be described as fairly average. The harvest has been rather protracted, the weather being showery, with occasionally very heavy thunder storms; added to which, men have been somewhat scarce. The late crops of wheat and oats have taken the rust much more than those earlier sown. The greatest help the colonies have had for some years has come now in the high prices of wool, which is the great product in Australia. The rise in price is fully two pence per pound over the price obtainable in 1888. This means something over two million pounds ($10,000,000) extra coming into the country more than that year from this one industry, and will help the financial institutions to a great extent. Added to that, we have in New South Wales had a new land act, which has given the pastoralist fixity of tenure, which was one of the things mostly wanted by our pastoralists.

The rise in wool is mostly attributed to three causes: firstly, the great cleanness of the last year's clip, being absolutely free from burr-seed or dirt; secondly, from the general commercial prosperity all the world over, more particularly in Great Britain; and thirdly, to the reported loss of twenty million sheep in the Argentine Republic.

The dairying industry is making great strides in most of the coast districts of Australia; factories springing up everywhere; as many as two and three large factories in one district, where twelve months ago there was not one. Some of the silver and gold mines here are giving splendid returns. The Mount Morgan gold mine near Rockhampton, Queensland, paid in dividends last year one million sterling. The Broken Hill proprietary silver mine last week turned out for its week's output over 137,000 ounces of silver. The capital, as represented by the present market value of shares in the Mount Morgan gold mine, amounts to the great sum of £7,000,000, and the Broken Hill proprietary mine about £4,500,000, with few sellers. Several other great finds are reported.

G. E. MACKAFFIE, New South Wales.

SCIENCE IN FARMING.

The Latest in Swine-Feeding.

For the past three years, the Wisconsin Station has been experimenting for the purpose of determining the effects of various foods upon the carcass, bones, and viscera of hogs. In all cases, cornmeal has served as a ration for one lot of pigs under study, because corn is and must continue to be the staple hog-food at the West. Against cornmeal has been fed a ration containing part cornmeal, but in addition such other ingredients as dried blood, peas, shorts, or skim-milk—foods rich in protein, or lean-meat producing. To avoid redundancy, the phrase "corn ration" will be understood to mean corn, salt, ashes, and water; "mixed ration" will mean part corn, and with the articles above mentioned containing considerable protein, together with ashes, salt, and water. Prof. W. A. Henry says the following seem to be fair deductions from these investigations:

For the market price or cost of production, Indian corn is beyond all comparison the cheapest single food for hogs. They will live a long time and make a fair gain upon an exclusive corn diet. When kept upon such a ration, they grow quite fat, but, when yet small, have the form and appearance of mature hogs, being dwarfed in size. When kept in the pen, they seem satisfied after eating, lying down in apparent comfort to await the next meal. The carcass of corn-fed hogs contains more fat and less water, twenty-five per cent less muscle, or lean meat, and less blood than carcasses of hogs given a mixed ration. The exclusively corn-fed hogs also have smaller livers and kidneys, the skeleton is lighter, and the bones not as strong; the hide may be less, and the hair is not as strong. Hogs living on corn-meal, water, and salt did not seem to have their bones strengthened by feeding well-water instead of rain-water. But hogs living on corn-meal, salt, and rain-water had their bones doubled in strength by feeding hard-wood ashes, and still further strengthened by feeding ground bone. The ash material in the bones of such hogs was doubled in amount, ground bone giving better results than wood ashes. The hogs also drank more water, consumed more food, and made much heavier gains than those not getting ground bone or ashes, but did not have more muscle or lean meat. Hence, Prof. Henry's final conclusion that while the body of the hog, perfect or imperfect, is the result of inheritance, it can be greatly modified by the kind of food given.

What the Stations are Doing.

A clever feature of the sixth annual report of the Wisconsin Station is that its 228 large-type pages give in plain and simple language the results obtained, with as few tables as possible. The scientific details are given in tabular statements in the appendix.

The mycelium or spores of fungous diseases often hibernate in seeds and germinate with them. Some diseases may thus in one sense be hereditary, the disease of the parent plant being transmitted direct to the seedlings by infected seeds. This accounts for the introduction of new plant diseases in many instances.

Puget Sound cabbage and cauliflower seed are large and sound and of high germinating power, but, according to the Ohio Station, there is no difference in the crop between plants grown from Puget Sound or Eastern seed, either in time of maturing or quantity and quality of crop. Given the same qualities in both cases, Puget Sound seed is more desirable than Eastern seed, simply because of the greater vigor of the plants grown from it.

The Rhode Island station is giving special attention to bee-keeping. Its Bulletin 4 is an excellent compilation as to the importance of the apiary, the most approved methods of management, and the line of experimental work undertaken. It directs attention to the decision of the Supreme Court of Arkansas as to the unconstitutionality of prohibiting bee-keeping, and to recent German laws which guarantee all land-owners the privilege of keeping bees. Testimony is given to prove that bees do not injure fruit.

The girdling of grapevines causes the fruit to ripen in New England seven to ten days earlier. There is no loss of sugar, and the fruit is increased in size, though more soft. But the latter is no objection when sold in local markets. Fruit trees may be protected from mice, rabbits, and woodchucks by painting the trunks with a mixture of a tablespoonful of Paris green to two gallons of paint. Trials with several Japanese farm crops are also reported in Bulletin 7 from the Massachusetts Hatch station.

The most comprehensive and practical statement of the fungous diseases of the cranberry is Prof. Halsted's work in Bulletin 64, New Jersey. A wet, warm season is most favorable to the development of the cranberry scald, for which no remedy has been found, although sanding the bog and controlling the water so that it will be low in summer are usually beneficial. The trouble is primarily due to a minute fungus that is found in all parts of the infected plant and also in the surrounding soil.

Market-gardeners are interested in the tests conducted at the various stations of different varieties of vegetables. The Ohio trials have shown in every case that the Early Wakefield cabbage yields a larger per cent of its crop at any given early date than Etampes or Express, and matures its entire crop earlier than either of the varieties named. All of the Early Jersey Wakefield were solid and fit for market, which commends this as the best early cabbage. There is, however, much difference in the various strains of seed of the same variety offered by seedsmen.

The brown rot of plums, cherries, and peaches does much damage. Such trees at the Ohio station (Vol. 2, No. 7) were sprayed April 11, before the leaves came out, with a simple solution of copper sulphate; with a solution of one pound of London purple in one hundred gallons of water on May 15; and on May 25, and again on June 5, with a combination of London purple and the Bordeaux mixture. The result was quite encouraging, although the rot was not fully prevented. The fruit was fairly well covered with the copper sulphate, which stayed on (despite the many rains) until it ripened in September, and had to be washed off.

It is usually estimated that 80 per cent of the manurial elements in the food consumed by cows is voided in their excrement. In Dr. Collier's experiments (eighth report, New York), fully 90 per cent of all the fertilizing constituents of the food consumed was voided, and, if properly preserved, may be used to maintain the soil's fertility. He found that, at the usual prices for commercial fertilizers, the amount of plant-food in the daily excrement (liquid and solid) of well-fed cows was worth over ten cents, or $36 per year. The daily food of these cows cost fourteen and one-fourth cents per head. Thus, nearly three-fourths of the cost of the food was got back in the manure.

Object lessons are easy for any farmer to learn. The Michigan experiment station appreciates this point. Its Bulletin 56 describes the ribgrass, or narrow-leaved plantain (*Plantago lanceolata*), which is such a pest in grass lands and lawns, and is now spreading rapidly in the Middle and Western States, especially in clover fields. Its spread is due to the fact that its seeds are largely mixed with clover seed. With each copy of this bulletin is inclosed a little packet of clover seed containing an admixture of plaintain seed, so that every farmer can recognize the difference at sight. After such a lesson farmers will be careful to inspect their clover seed and buy only pure clean seed.

The black rot had for several years destroyed the fruit in a Columbus, O., vineyard. Last year it was sprayed April 16, before the leaves had appeared, with a simple solution of sulphate of copper, treating the posts and trellises as well as the vines to destroy the winter spores of the fungus. It was next sprayed May 17 with the Bordeaux mixture, made by filling a Nixon barrel-machine, which holds fifty gallons, nearly full of water, and then adding three or four gallons of hot water in which six pounds of copper sulphate crystals had been dissolved. Four pounds of freshly-slaked lime were then poured in, and after a thorough stirring the mixture was ready for use. Sometimes, instead of the crystals, powdered copper sulphate was used; it was put in the barrel of clear water and was soon dissolved. A third and last application was made June 25 with the same mixture. C. M. Weed says the treatment was very successful, although in adjoining vineyards the crops were wholly destroyed. The crops were more or less covered with the mixture, however, which (according to the Delaware station) can be easily removed by immersing the bunches in a solution of ten gallons of water to two gallons of cider vinegar. The same mixture was used with beneficial effect for the quince-leaf spot, but proved injurious to apples when applied for the scab.

The Oued Pir' region of the Algerian Sahara desert is a long plain, about fourteen miles in width, bounded on either side by rocky plateaus. It is forty feet below the surface of the sea, and the water bearing strata is 230 feet below the surface. When this water is reached, it comes up with great force at first, and often breaks through the overlying rock, forming little lakes, in which fish in large numbers and several varieties are found. During the last seven years a French reclamation company has created three oases and three villages, sunk nine artesian wells, each securing a water supply of 5000 gallons a minute, reclaimed and put under cultivation over 900 acres of land, planted 50,000 palm trees, constructed more than 25 miles of irrigation canal, and built houses and cottages for the workmen, as well as stores and depots. This has taken nearly $150,000, and there is every prospect that the venture will turn out a profitable one. About eighty palm trees may be planted to the acre, although the average does not reach that number, and, in good seasons and under favorable conditions, each tree yields a profit of about $1.80. Although the plantations are not yet in full and vigorous bearing, the company exports large quantities of dates into France, the season of 1888–9 having yielded over 130 tons. The henna and madder plants are also largely grown, as well as rye-grass, cereals, millet, maize, wheat, and barley.

EXPERIMENT STATION LITERATURE.

ALABAMA—Exp. Sta. at Auburn, Bul. 9, December, 226 pp., 6 plates, nematode root-galls; Bul. 10, January, 16 pp., grape culture.

CONNECTICUT—Annual report of the trustees of the Storrs ag'l school at Mansfield, 38 pp. Exp. Sta. at New Haven, Bul. 101, January, 4 pp., analyses of six nitrogenous superphosphates.

KANSAS—State Board of Agriculture report for the quarter endiug Dec. 31, 1889, 144 pp., 4 plates, with an appendix of 32 pp. and 5 plates on pig-feeding experiments: M. Mohler, Secretary, Topeka.

LOUISIANA—Bureau of agriculture, monthly crop reports, embracing also notes from the various experiment stations. Exp. Sta. at Baton Rouge, Bul. 25, October, 30 pp., analyses of commercial fertilizers and other substances useful to agriculture; Bul. 26, annual report.

MASSACHUSETTS—Hatch Exp. Sta. at Amherst, Bul. 7, January, 24 pp., small fruits, gypsy moth, combined fungicides and insecticides in potato-growing. Bul. 13 of the meteorological report. State station at Amherst, Bul. 35, November, 12 pp., feeding experiments with milch cows.

MICHIGAN—Exp. Sta. at Agricultural College, Bul. 55, December, 32 pp., fruit-testing at the South Haven substation; Bul. 56, February, 4 pp., rib-grass or narrow-leaved plaintain in fields of clover, with samples of seed.

MINNESOTA—Exp. Sta. at St. Anthony Park, Bul. 9, November, 28 pp., 20 illus.; Russian willows and poplars.

MISSOURI—Exp. Sta. at Columbia, Bul. 9, December, 78 pp., study of the life history of corn at its different periods of growth.

NEW JERSEY—Exp. Sta. at New Brunswick, Bul. 63, December, 26 pp., experiments on tomatoes; Bul. 64, December, 40 pp., some fungous diseases of the cranberry.

NEW YORK—Exp. Sta. at Ithaca, Bul. 14, December, 16 pp., on the strawberry leaf-blight, on another disease of the strawberry. Exp. Sta. at Geneva, eighth annual report of the board of control, for 1889, with reports of director and other officers, 424 pp.

NORTH CAROLINA—Exp. Sta. at Raleigh, Bul. 67, October, 16 pp., seed tests; Bul. 68, November, 8 pp., farm and dairy buildings.

RHODE ISLAND—Exp. Sta. at Kingston, Bul. 4, December, 28 pp., bee-keeping.

SOUTH CAROLINA—Exp. Sta. at Columbia, Bul. 7, October, 20 pp., meteorological data.

UNITED STATES DEPARTMENT OF AGRICULTURE at Washington, D. C.—Nos. 6 to 10 of *Insect Life*. Bul 4, Experiment Station Division, November, 28 pp., list of horticulturists of the agricultural experiment stations in the United States, with an outline of the work in horticulture at the several stations. Monthly reports of the Statistical Division.

VERMONT—Exp. Sta. at Burlington, Bul. 18, January, 20 pp., pig-feeding.

WISCONSIN—Exp. Sta. at Madison, annual report for year ended June 30, 1889, 252 pp.

FOREIGN—Queensland, report of Dept. of Agric. for year ended June 30, 1888, Hon. Peter McLean, secretary; also, Cultural Industries for Queensland, 230 pp. octavo; catalogues of grasses and economic plants in the Queensland court or test garden; Guide to Queensland, 222 pp., 8 illus.; report on agricultural and pastoral conference held at Brisbane Aug 21-23, 1889, 56 pp.; report of scientific expedition to Ballenden-ker range upon its flora and fauna, 128 pp.; report on insect and fungous pests, 2 plates, 238 pp.

The Right Thing at the Right Time.—We have six or seven years of back numbers of the AMERICAN AGRICULTURIST, and they have been diligently read and referred to. My son is the fourth generation on the farm, and I hope he and his heirs will go right on reading the AMERICAN AGRICULTURIST for another hundred years. I am very thankful for the many things I have learned from your pages; they have never failed to give me the right thing just at the right time.

C. H. WIGGINS, Fulton Co., N. Y.

Cannot do Without It.—We have been taking your valuable paper so long that we cannot do without it. The paper alone is worth more than the subscription price, even if we never got anything more with it.

DARIUS CLAGGETT, Montgomery Co., Md.

FARMING IN FOREIGN LANDS.

Queensland wheat-growers are proving by experience that the hard wheats are the most rust-resisting. Their immunity from the attacks of the rust fungus appears to be due to the large amount of silica they contain, which is from two to three times as much as the silica occurring in the seed and straw of other varieties.

The English government expects to save nearly $50,000 a year by using jute instead of hemp twine, in the post-office department throughout that country, for making up bags and parcels, the cost of jute being only one-half that of hemp twine. This example is likely to be generally imitated, and may in time affect the market for hemp.

Traveling dairies are getting to be quite common in Australia, wherever the various agricultural and pastoral societies are willing to coöperate in working the plant. They generally stay ten days in each place, and the local agricultural society nominates five pupils to receive a special course of instruction from the manager. The result has been very gratifying.

The farmers of Queensland, Australia, are much concerned over the appearance of a fungoid parasite on their tobacco plants. Microscopical examination of a diseased leaf revealed a mass of interlacing filaments and globular seed spores covering the surface, especially the under side, showing that the fungus is similar to that which attacks vines. No remedy has been discovered.

A movement is begun in Germany to utilize to a greater extent the banana fiber, which extends the entire length of the branchless plant, and is capable of being divided into threads of silky fineness. In Central Africa this fiber is dried and used for shoe-strings and for cords and ropes, but it is believed that it could be used in various manufactures, the same as cotton, hemp, flax, and similar plants.

In Africa, the palm-tree is cultivated not only for its fruit, but almost all parts are useful for conversion to some purpose or another. A very stringent resin is produced from the cellulose or fiber of the tree, which is made use of in pharmacy for healing wounds. The pollen of the male plant is made use of in preparations for the skin, the roasted stones of the dates are employed largely as a substitute for chicory and even coffee, while various pharmaceutical and other products are obtained from the roots, leaves, and branches.

Experiments to prove the virtues of salt in keeping farm crops in a healthy and vigorous condition have been carried on extensively in some parts of England, and the results lead to the following conclusions: That a dressing of 1,500 to 2,000 pounds of salt per acre will check the rust in cereals, the finger-and-toe in turnips, largely protect oats against the grub and wire-worm, check the virulence of potato disease, and dissipate fungoid growths in pastures. It is also a preventive against moss, makes rough grass more palatable, and sweetens the herbage generally.

The imperial government of China has recently ordered the construction of a railway, 700 miles in length, from Pekin to Hankow. The leading spirit in this great movement is Marquis Tseng, Chinese ambassador in Britain, who believes that, by a good system of railways, to open up the rich mines and agricultural resources of the interior, China will be able to hold her own against any of the European powers. Great Britain will also be a gainer by this opening up of China, as she has leave to trade in twenty-two ports. The railway is to be constructed by native workmen, and without the aid of any foreign syndicate.

An Australian farmer, during the last season, tested the oft-repeated statement that a bean used in each potato hill would keep away the potato beetle, the theory being that the smell of the bean was so obnoxious that the bug would not feed in its vicinity. He planted several rows of late potatoes, but, as soon as the potato sprouts appeared, the bugs went to work with their usual activity. They would not eat the bean plants, but were frequently seen on them. The planter was obliged to desist from applying insecticides for fear of poisoning the beans, and so his potatoes were a total loss.

A small boring beetle is doing much harm to the stems of plum trees in Worcestershire and North Gloucestershire, England. When the young plum stems are about three-quarters of an inch apart, the beetle bores into them, making a horizontal burrow half or two-thirds round the young tree, or vertically up and down the central pith. In this way the passage of the sap is stopped, and the young tree soon dies. The only effective remedy thus far known is to burn the infected trees or branches, although several washes are recommended, including a wash of soft-soap made into the consistence of a paint by the addition of a little washing-soda.

India exported nearly fifty-nine million pounds of tea during the six months ended November 1, 1889. This is three million pounds more than was exported during the corresponding period of 1888, and seven million pounds in excess of the same period for 1887. Of this enormous product, Great Britain took all, except three million pounds. Ceylon is another large tea-exporter, and for the year ended September 1, 1889, her exports amounted to thirty-five and a half million pounds, or an excess of twelve million pounds over the previous twelve months, and twenty million pounds over 1886-7. It will be seen that at this rate Ceylon's exports of tea will, in a few years, surpass those of India.

Farmers are in an unusually prosperous condition in the Argentine Republic, the harvests having fulfilled their promise, and the price of wool being even higher than expected. Besides this, they receive gold prices for their consignments to European markets, while paying for labor in depreciated currency. This depreciation of currency extends throughout the Argentine Republic, and is the result of high taxation and rents, as well as a lack of confidence in commercial trades, brought about through the recent large failures of importing houses. This condition of affairs has caused a great accumulation of deposits in the large banks at Buenos Ayres and Rosario, so that in the provinces many of the local banks, in spite of their millions of paper money, are unable to cash even small checks for their depositors.

The poisonous tick is the cause of considerable loss among Australian stock. This pest sucks the blood out of the animal on which it has attached itself, and it is supposed that some poisonous secretion of the tick passes into the animal. Two or three ticks will kill a horse in a week or ten days if they are not discovered before that time and pulled out, while dogs and some of the other animals will not live as long after being attacked. Animals which have been seriously affected with ticks and have recovered—which is, however, a rare occurrence—become tick-proof, and, as native animals are tick-proof by heredity, most of the loss occasioned is with the introduced animals. These pests would kill human beings in the same way but for the fact that from the itchiness they cause they are invariably found and pulled out.

But few countries offer bounties on any of their agricultural produce or articles made therefrom. The Argentine Republic, through the influence of its successful agricultural society, has, since 1878, set aside a yearly sum amounting to nearly $400,000 for premiums on the exportation of live cattle and beef. Mexico passed a law in November last to offer a bounty of ninety-six cents per ton on all wheat exported from that country. The Greek government gives a drawback on grain, but, as the amount does not exceed the import duty on the same produce, it is practically but a remission of the import tax. Bavaria and Belgium offer drawbacks on beer equal to the import duty on raw malt, and France gives a bounty on salt used in the preparation of its exported butter and meats. The proposed export bounty on American flour finds but little favor in the United States.

While the locust is not confined to any one country, it is particularly the pest of the farmers in India and Africa, where the sirocco, or hot winds, facilitates the hatching of the eggs. A short time ago the pests inflicted terrible sufferings on the people of Algeria, and at Setif the streets and walks were invaded by the insects, which were often so numerous as to obscure the sun, and did not depart until they had left acres upon acres of desolation behind them. The farmers at Bou-Saada dig big trenches in the soil, by the side of which are placed pieces of canvas, covered with metal bands, and, when the trenches are filled with the insects, the men beat them with flails until they are reduced to a pulp. This does little good, however, on account of the large number. A few years ago squadrons of cavalry were employed to beat down the locusts, but to little purpose, and the government has been unable as yet to discover a remedy.

Poultry Shows, Past and Present.

In old times a poultry show was a small, neighborly affair. Buff Cochins and Shanghais were the main stock. Mr. Adams's great, solemn cocks and hens, which had traveled first from China, and then from England, were admired by all the farmers of the county. "Neighbor" Briggs's Shanghai cock, which could stand on the barn floor and eat corn from the top of a barrel, divided attention with "Widow" Carter's "Dutch Everlasting Layers," with their dove-like heads; and Judge Dering's white-crested, black Polish hens were the prettiest chickens that ever were or ever will be seen.

This year, in New York, the large hall of the American Institute was none too big for the thousands of poultry and pigeons shown. The roar of their combined crowing and cackling could be heard out on the street, and no one who did not know what made the noise would be able to imagine its origin. The wideness of the poultry interest was felt at once on entering. By the door stood a keen, dark man, talking eagerly to a manager. He is the mentor and guide for one of the largest "broiler" towns. He runs a paper, he knows about incubators and brooder-houses, he keeps his finger on the pulse of the poultry-fever people. Going down the aisles between the fowls,—which are some of them rich women's pets and some of them the bread-winners of farmers,—one saw groups of men weighing and studying the competing birds, and was sure, from the earnest way they were working, that their decision would be just. On farther, other men were taking the AMERICAN AGRICULTURIST photographs of the show, which have gone all over the world. Down one aisle came a millionaire who spends money and leisure hours on his poultry pets. He passed by a bright-faced girl, who tells a story of cheerful, pleasant, work. There was danger of her health breaking down over the type-writing she used to do, and she went out on Long Island and began raising chickens and ducks for a living. She is the happy owner of hundreds of thrifty little chickens; she has a "lovely" incubator; she is convinced that her own breed of poultry is the right one. She buys eggs and chickens from farmers, puts them up in a "fancy" way and sells them at "fancy" prices. She has hard work, indeed, but also she has the cheery spirits that make life rich.

Fashionable women and children, and rosy, cosy, unfashionable ones, clustered about a cage near the entrance, hoping to see the trained Bantams pull a string, and open their feed-box—which they usually wouldn't do. Rough men laid bets about the chances of the game-cocks, whose style and spirit might have shamed them into standing up straighter.

Counting all colors and kinds of a breed together, the largest classes of birds exhibited this year were two hundred and nine Leghorns, two hundred and five Cochins, one hundred and eighty-nine Wyandottes, one hundred and sixty-three Brahmas, one hundred and forty-seven Plymouth Rocks. The largest number exhibited of one separate color and kind was that of one hundred and twenty-four Light Brahmas, and next that, the one hundred and twenty Barred Plymouth Rocks. So it is hard to decide which is the typical American fowl.

The greatest contrast to old times was found in the incubator quarter of the hall. At the County Fair poultry shows, about twenty years ago, there was much gossip concerning a wonderful new machine for hatching chickens by hot water, which was for sale in Boston. Some people were sure it was going to equal the great hatching ovens of Egypt. But the canny farmers and their more canny wives shook their heads. They thought the Egyptian oven stories no better than fairy tales, and prophesied that any way such chickens would be moulters, and that the pullets would never lay eggs which would hatch. This year there were incubators at the Poultry Show which were quite as reliable and far more convenient than the famous ovens by the Nile. Chickens were cracking their shells, or casting them off forever. There were disgusting little wet chickens, and bewitching little frou-frous of dry chickens, and, funniest of all, there were those comedians, little ducks, wobbling about among their unhatched brethren.

The prizes offered for dressed poultry and heavy-weight eggs were a move in the right direction. In these matters we are behind the French and English. The whole Show was amusing and interesting.

E. K. WINANS.

OUR BASKET.

Varieties of Sweet Corn.—E. P. Spence, Essex Co., Mass.: To obtain the earliest and latest sweet corn, with a constant supply between, a good selection is the following, which we name in the order of their maturity: First, Cory; second, Perry's Hybrid; third, Shaker's Early; fourth, Crosby; fifth, Hickox Improved; and sixth, for very late, Gold Corn.

Feeding Cows when Manure is no Object.—J. C. Roth, Mahaska Co., Iowa, asks us several questions in regard to the best feed for cows, "independent of the result of manure, as I can get all the manure I want delivered at my farm for nothing." With manure for nothing, and corn almost cheap enough to use for fuel, we should let the "nutritive ratio" theory severely alone. Good hay, or grass, bran, and corn ought to make a good cow give good milk; or, if it will not, let her get fat, and kill her for beef, and get another.

An Illinois Vineyard.—Mr. C. B. Rockwell, Hancock Co., Illinois, writes: My vineyard consists of Concord and Worden vines set nine feet apart each way. I shall this spring sow the entire vineyard to clover, which I shall leave uncut, to mulch the ground and check the growth of the vines. I shall spray faithfully as a protection against rot.

Hen-Manure.—Thomas S. Gillespie, Albany Co., N. Y.: The droppings of the hen-roosts make a very strong, concentrated fertilizer. For general purposes, it is best composted with stable-manure. If used alone, it should be mixed with several times its own bulk of earth, and there must be no direct contact with seeds. Melons, cucumbers, squashes, and radishes will be benefited by very liberal quantities well incorporated with the soil. It is best not to plow it in, either in spring or fall, but work it into the surface soil.

Manure Drying Out.—C. A. Jewell, Lenawee Co., Mich., writes us: "Do you think manure loses anything during our long severe droughts by being so completely dried out before we can get it plowed under, or worked into the soil?" Probably little, except water and carbonaceous matter, which are of no manurial value. If there was ready-formed carbonate of ammonia in the manure this would be lost, but in fresh manure, or in manure that has been properly piled and fermented, there is little or no carbonate of ammonia. There is no ammonia in absolutely fresh dung. It is formed by fermentation, but at the same time, in a properly-managed heap, organic acids are formed that unite with the ammonia and hold it. By the action of microbes, also, ammonia is converted into nitric acid, which unites with lime, potash, soda, etc. These nitrates can be readily washed out of the manure, but little or no loss takes place by drying. A little of the organic nitrogen of the manure is sometimes lost by exposure to the sun and air, but rarely to any serious extent.

Are We Impoverishing Our Farms by Using Artificial Fertilizers?—C. A. Jewell, Lenawee Co., Mich., writes us: "Agents are around hectoring the life out of us and urging us to try artificial manures. Some men tell us that if once you begin to use them you cannot raise decent crops afterwards without them—that in many parts of the State farmers cannot raise crops without them, even with barn-yard manure." This is nonsense. And yet it is true that a farmer who once commences to use artificial fertilizers rarely stops using them. John Johnstone, "the father of underdraining," used to say that he never knew a man commence to underdrain, and who did the work properly, who ever stopped until his whole farm was drained. It is a dangerous thing to set out a patch of strawberries. You will probably have to keep planting them as long as you live, and will be likely to set raspberries, blackberries, peaches, etc., to keep your table supplied with fruit during the season. Artificial manures do not impoverish the soil any more than underdraining, or liming, or good plowing, and thorough cultivation. In fact, in some cases, not as much. For instance, if a virgin soil (like the prairies) is full of insoluble, nitrogenous, organic matter, plowing and cultivation by exposing it to the air convert the nitrogen into soluble nitrates which are taken up by the crops. But if there were more nitrates than the plants could use, from lack of phosphates, the excess of nitrates would be leached out of the soil and lost. But if you applied phosphates, the increased growth of the crops would take up the nitrates and prevent their leaching away. In such a case, the profit and advantage of using phosphates is very great. When the time comes, as come it will, when consumption gets ahead of production, phosphates will be used to an enormous extent on the wheat-lands of the West. This subject is worthy of more consideration than we can give it at this time. We may say, however, that Mr. Jewell, and other farmers in Michigan, need have no hesitation in trying artificial manures.

Chinese Strawberry.—Miss S., Poultney, Vt.: The Chinese strawberry (*Fragaria Indica*), has bright yellow flowers and bright scarlet round fruit about three-quarters of an inch in diameter. It might not prove hardy in Vermont, but it is sometimes cultivated in greenhouses as an ornamental plant in hanging-baskets and pots. The fruit is borne on long drooping stems, and is very pretty, remaining firm and sound for several weeks after it is colored. The monthly red Alpine strawberry is also an excellent variety for house-culture, and with moderate care will bear fruit all the year round, and the berries are sweet and good, but not what would be called high-flavored.

Manure for Nursery.—F. M. Borden, Nova Scotia: Where plenty of wood-ashes can be obtained, no other fertilizer is needed on a good alluvial soil, to promote growth of nursery stock. If it is desired to stimulate rapid growth, the ashes might be supplemented with nitrate of soda applied separately at the rate of two hundred pounds per acre.

Petroleum as a Preservative.—Josiah Todd, Tompkins Co., N. Y.: Do not give credence to reports of timber being rotted by contact with petroleum. On the other hand, it is an excellent preservative against decay. Shingles dipped in petroleum before they are laid will last much longer than otherwise, and it is well to repeat the application at intervals of two or three years. But rain-water caught from a freshly-oiled roof is spoiled, and the danger of taking fire from sparks is increased. Petroleum is useful in preserving stable floor-planks and other wood.

Mixed Planting.—Jasper Blines, Clark Co., Missouri: It is not advisable to set grapevines between rows of currants and gooseberries. The land between the grapes needs cultivation, and the grape-roots will soon extend so far as to fill all the soil. Potatoes, or other low hoed crops may be raised between the rows of grapevines the first two years after the latter are planted. After that, they need all the ground.

Cutting Straw.—John E. Lee, Butte Co., Cal., writes us: An important matter throughout the West is the disposition of the thrashed straw. I am convinced that it would more than pay to have a cutting device attached to the separator, which would cut the straw fine. It would then occupy less space, and could be received directly from the straw-carrier upon wagons fitted with box-shaped racks. At a proper distance, the straw could be distributed from the wagons and spread evenly over the ground. In this condition it would not interfere with plowing.

Time to Cut Cions.—George W. Beebe, B. C.: In all cold climates it is the usual practice to cut cions for grafting during the winter months, then store them in moss or sand in a cool cellar until wanted for use in spring. By cutting the cions in winter and storing them, as directed, they remain dormant later than if left on the tree; consequently, the season for grafting may be somewhat prolonged in opening. Cions from bearing trees are generally considered better than those from young nursery trees. Still, the latter may be used if other kinds are scarce. Your three-year-old plum trees should certainly be grafted this spring, but you will probably succeed best with the seedling cherries by budding them in summer. Seedling apple stocks may be taken up in the fall and root-grafted during the winter, and then planted out in spring. This is the usual practice in our larger nurseries. A. S. Fuller's work on the "Propagation of Plants" would be of much value to you in your nursery operations.

Borers.—A Reader, Red Bank, N. J.: Your suggestion that the mild weather this winter should be taken advantage of for cutting the borers out of peach and apple trees is an excellent one. The borers or grubs are now large enough to be readily found, and, if destroyed now, the work will not have to be done in spring, or perhaps, as is often the case, be entirely neglected. Owing to the mild weather, the borers have not, as is usual, remained dormant, but have been working most of the winter, and they will probably pass through their natural transformations and the beetles and moths appear much earlier the coming spring than before in many years. While looking for apple-tree borers, take a look at the quince trees or bushes, for the same insect infests both. The peach-tree borer attacks the dwarf flowering-almonds, so extensively cultivated for ornament, and these shrubs should not be overlooked while seeking this pest.

Coal-Ashes.—A Farmer, Goshen, N. Y.: While it is true that chemists tell us that the ashes from hard coal contain scarcely an appreciable amount of potash or other material likely to promote the growth of plants, still, there are practical gardeners who think they are worth saving as a fertilizer. The best way to determine their value is to make a few experiments in your own garden or field. Sift out the coarse coal and clinkers, and then scatter the ashes over different spots in your garden, marking each so that in planting you will know just where the ashes have been applied. Now let your rows of peas, beans, or other kinds of plants, cross these spots where the ashes were spread, and then you can determine whether or not they have any effect on growth. It is not at all difficult for every cultivator of the soil to settle such questions for himself.

An Early Honeysuckle.—Miss C. D., Yonkers, N. Y.: The first hardy shrub of any kind to bloom in our garden in spring is the Fragrant Chinese Honeysuckle (*Lonicera fragrantissima*). It is a large, sturdy, wide-spreading shrub, and evergreen in protected situations and mild winters. In England it is said to usually bloom in February, and it has been in bloom since the first day of the month in our garden this year, but this is unusually early; yet we can always depend upon having it in bloom as soon as cold, freezing weather is over in winter. The flowers are white and nearly an inch in diameter, and exceedingly fragrant. This handsome species of honeysuckle does not seem to be common or very well known, although it has been in cultivation in some of our older gardens for nearly or quite a half century. It is very hardy and readily propagated by cuttings.

Sweet Peas.—Miss W., New Rochelle, N. Y.: If you want sweet peas to bloom early, sow the seed as soon as the condition of the soil will permit. There is no danger of the seeds or plants being injured by frost. If the soil is a moderately light and dry one, the seed may be sown with safety in the fall; in fact, we know of some amateur florists who sow in the fall, for an early supply of flowers. Cover the seed about three inches deep, and make the soil very rich. Cut the flowers every morning if you would keep the plants a long time in bloom.

Dwarf June-Berry.—J. F. S., Newburgh, N. Y.: One of the great faults of the Dwarf June-berry is its habit of producing a great number of suckers from its subterranean stems or roots. If these suckers could be removed as readily as those of the raspberry and blackberry, there would not be much difficulty in keeping the plants in a narrow row; but, unfortunately, the underground stems are very tough, and, if we undertake to cut them off with a plow, the entire plant is very likely to be torn out. Owing to these peculiarities, the cultivation of this fruit is somewhat difficult, and, if the bushes are left to take care of them-

selves, they will be soon choked with weeds and grass, and the fruit become small and not very abundant. It has been proposed to graft the dwarf varieties upon stocks of the tall or tree form of the same species, and we are inclined to think this will be adopted, especially for grounds of limited extent. It may be that some other stock will be found equally as good among trees and shrubs of the same family. This is an excellent field for experiment.

Wild Flax.—Subscriber, Santa Fe, N. M.: The wild flax with blue flowers which you find in New Mexico is not the same as the cultivated European flax. There are about twenty indigenous species of flax (*Linum*), chiefly to the regions west of the Mississippi, and mostly slender annuals, some resembling very closely the cultivated flax, but none possess so much and strong a fiber in their stems as the common flax. If the European flax, *Linum usitatissimun*, descended from some American annual species, as you suggest, it must have occurred long ago, for manufactured flax fiber has been found in the prehistoric lake-cities of Switzerland, and in the mummy-cloth of Egyptian tombs. Still, we will not say that such a descent is impossible.

The Freesias.—Amateur, Paterson, N. J.: The two species of lily-like plants recently introduced from the Cape of Good Hope bid fair to become very popular, not only among professional florists, but with amateurs as well. The bulbs multiply rapidly and under the most simple cultivation, blooming freely in winter in a cool greenhouse or in a moderately warm room. As soon as the leaves wither after blooming, the bulbs should be dried off, or no water given the soil in which they have been growing. If grown in pots or boxes, set these away in a dry room, and leave them there to dry until the following autumn; then sift out the bulbs, and plant again. If a succession of flowers is desired, plant at different times, from September or later, up to midwinter. The Freesias are excellent window plants, and the flowers very fragrant.

Nut Culture.—A. B. D., Jamaica, N. Y.: We have had so little experience in this country in cultivating the European walnuts, filberts, and chestnuts, that it will be well to go slow, and find out just what varieties succeed best before planting very largely of any. Of the English walnut, as it is usually called, nearly all the bearing trees in this vicinity have been raised from seed, and can scarcely be called distinct varieties. Of the many varieties of European filberts that have been tested here, all appear to be hardy and productive, but in some localities, or soils, a part of them suffer or are totally destroyed by blight, a disease very much resembling the pear blight. Of chestnuts we have several varieties, raised in this country, which promise to be equal to the best and most valuable found in Europe; but as yet there are few trees in bearing, except the originals, so, upon the whole, we can only say that nut-culture promises well, but is not, as yet, an assured success.

Trees for the Northwest.—A. W. Sias, President of the Minnesota Horticultural Society, writes us that danger from sun-scald is a much more serious matter in high latitudes than farther south. He furnishes the following list of a dozen deciduous trees that may be planted in open, exposed situations, without danger from sun-scald, viz.: corky white elm, weeping white elm, red elm, hackberry, cottonwood, Kentucky coffee-tree, white oak, burr oak, pin or Spanish oak, white ash, shell-bark hickory, golden willow. This list embraces some of the finest native deciduous trees for parks, streets, or as single specimens in ornamental grounds of considerable size.

Killing Osage Orange.—Williamson Co., Tenn.: When deciduous trees and shrubs are cut down in the autumn, winter, or early spring, they are very likely to throw up sprouts from their stumps and roots, because the roots contain a large amount of assimilated sap, which is necessary for the production of buds and growth of wood. We have only to deprive the roots of any plant of a supply of this assimilated sap to insure their speedy death, and as assimilation takes place in the leaves we may either remove them or cut off the channels by which the assimilated sap finds its way to the roots. The pioneers who made their homes in the great forests of this country, a half century to two centuries ago, may have not known anything of the circulation of sap in plants, but they learned from experience and observation that if they girdled a tree one season it was sure to die, root and branch, the next. Now, if you will take a hatchet and girdle your large Osage-orange trees, and let them remain standing until next spring, we think you will find, in 1891, that they are dead, roots and all. Any that are not large enough to girdle should be left as they are until next August, and then cut down close to the ground. To cut them down at this season would be merely giving them a good pruning, and the sprouts would come up the stronger as a natural result of the operation. Sometimes cutting down a tree just before it finishes its growth in summer will kill the roots as well as top.

Cost of a Brooder-House.—C. H. Olden, Mercer Co., New Jersey: Mr. W. H. Hopping, who furnished the drawings and description published on page 62 of our February number, gives the cost as follows: "A brooder-house and incubating-room, including heater, pipes, etc., costs, in Hammonton, about $750. The four lines of pipes required in such a house measure about 280 feet, the cost of which, with the boiler, is $200."

English Elms.—F. D. Grant, Conn.: There are a large number of varieties of the English elm (*Ulmus campestris*), and the piece of bark you sent, covered with a cork-like excrescence, was probably cut from a twig of the variety known as the Cork-Barked Elm, the young branches being corky instead of smooth, as in the species. These corky ridges are not a sign of nor the result of a disease, but natural, hence the trees are fully as valuable as the others in your nursery.

Grafting Walnuts.—G. H. Heffner, Bedford Co., Pa.: It has been reported that the English walnut has been successfully grafted upon the black walnut in California, but we do not know of any attempt to graft upon this stock in the East. The common butternut is a more closely-allied tree, and for this reason is preferable as a stock for the English walnut, and, furthermore, it is fully as abundant and cheap in our nurseries. The grafting should be done early in spring, and upon small stocks, not old and large trees. But we may as well say to you and others who may be inclined to try to graft the walnut, that it is a very difficult operation to perform with success, in the open air, especially in cool climates. Just why the climate should make so much difference we do not know, but the fact that it does has been known among nurserymen for many centuries. You can obtain cions of the English walnut from almost any nurseryman in Pennsylvania or New Jersey.

Vermont Horse-Breeders.—The sixth annual summer exhibition of the Vermont Association of Road and Trotting-Horse Breeders is to be held in Rutland, August 26th to 28th. These meetings bring together the largest and best show of useful road horses,—the descendants of the old Morgans,—to be found anywhere in the country.

The Turtle as Gardener's Assistant.—One of the most useful requisites of the greenhouse is one of our common box-turtles. Turtles are carnivorous—constantly on the alert for insects of all denominations; their special delight being slugs, snails, and wood-lice, the gardener's worst pests. One turtle will do the work of a house thoroughly, a work that taxes the time and ingenuity of the gardener, and is rarely half done. In the greenhouse the turtle is quite at home, never in the way, and always at work.

Brewers' Grains.—C. F. Lee, Morris Co., New Jersey: The actual value of brewers' grains as food for milch cows is a disputed point. But they are largely used for the purpose by many of the best dairymen. In a case like yours, where the milk and butter are used in the family, there can be no possible objection to them, if pure and fed fresh before putrefactive fermentation has begun. They are always to be fed in connection with coarse food.

An Important Correction.—In the interesting advertisement of the Mapes Manures, which appeared in the AMERICAN AGRICULTURIST for March, on the second cover page, the amount of ammonia in Mapes Vegetable Manure was printed as 1.86 per cent. This was a typographical error. The correct figures are 6.86 per cent. In other words, this manure contains on the average nearly seven per cent of ammonia (nitrogen). This accounts in part for the wonderful effectiveness of the Mapes Vegetable manure in forcing an early, quick, and profitable growth of the crops to which it is applied. The correction is an important one, for Prof. Mapes says, in his reference to it: "No fertilizer concern has ever been able to make such a showing of station matter as we do in the announcement referred to." The great point here is, all the figures given are the average of numerous analyses at several stations, and thus represent faithfully the average quality of the goods. This is a very different matter from selecting the highest average of an occasional "lucky" sample.

The Great White Michaelmas Daisy (*Chrysanthemum uliginosum*, *Pyrethrum uliginosum*).—Do not let the planting season go by without getting a plant of this, one of the most beautiful and useful of all our hardy perennials. It is a strong grower, reaching the height of from three to four feet, very branching, and free-flowering. One of the advantages of this plant is its coming into flower in the autumn and continuing its bloom until killed down by frost. Its flowers are much larger than are those of the French Marguerites, pure white, with yellow center, and of much substance.

Spare the Maples.—Stanton Hitchcock, Orleans Co., Vt., writes us: "It is deplorable to see farmers cutting down thrifty sugar orchards, which, if spared, would furnish employment at the time of year when there is little else to do on the farm. Such short-sighted farmers sit around waiting for spring to open, while their more thrifty neighbors are making maple-sugar which they sell to them for the money they realized from the sale of the timber."

Profitable Dairying.—M. T. Lawson, Orange Co., N. Y., writes us: We have received for milk sold at Baker's creamery, Mountainville, during three winter months, $353.42, as follows:

November, yield from 10 cows.....4,027 qts.	$110.73
December, yield from 10 cows.....3,929 qts.	122.57
January, yield from 11 cows.....4,004 qts.	120.12
	$353.42

This was in addition to the milk and cream used in the family. The cows are "natives," and the feed and care were as follows: Hay, two parts; corn-fodder and oat-straw, each one part; six bushels for twelve cows; cut fine and wet with cold water, then thirty pounds of wheat middlings mixed thoroughly. Night and morning, thirty pounds of dried brewers' grains and three pounds of corn-meal. All rations slightly salted. Then, after milking, the above cut feed, followed by a lock of hay to each cow. They are kept stabled all the time, except when turned out, while the stable is cleaned and ventilated, at 10 o'clock every day.

The Gopher Pest.—M. E. Swan, Dawson Co., Nebraska, writes us: The gophers (little ground-squirrels) give us much trouble by digging up the seed corn. To check their work it is quite common to harrow the ground as soon as the corn is planted. This does not go deep enough. I use a five-tooth cultivator, with the middle tooth shifted to one side to escape the row of corn. If they are very numerous, I plant deeply with a drill, and run the cultivator over the rows. Some farmers poison corn with strychnine, and scatter it on the ground, but this is fatal to many birds. Others put the poisoned corn into the gopher-holes, but that is slow work.

Peach Yellows.—E. Sellew, Kings Co., N. Y.: A liberal dressing of concentrated potash around the roots of a peach tree would doubtless prove quite beneficial as a fertilizer, but it is scarcely probable that it would have any remedial effect in a case of yellows, which is a bacterial disease, pervading the entire sap of the tree. Peach trees are often suspected of the yellows when the trouble is caused by borers under the bark at the base of the stem. If they are dug out, the foliage will soon lose its sickly yellow color.

The Turk's-Cap Lily.—It is a mistake to suppose that this lily (*Lilium superbum*) can only be well grown where there is an abundant supply of moisture. Although a swamp plant, and never found elsewhere except under cultivation, yet it will greatly improve by being planted in dry soil. At Dosoris, under Mr. William Falconer's care, this lily can be seen, in summer, nearly eight feet high, with from thirty to forty flowers on a stalk, grown in dry, sandy soil, well mulched with leaves.

AMERICAN AGRICULTURIST
FOUNDED IN 1842

APRIL, 1890.

The Depression in Agriculture.

The consideration of this subject in the AMERICAN AGRICULTURIST for March attracted national attention. A number of the foremost agriculturists and statesmen of the country present their views upon the question in the following columns. Most of them overlook what in our judgment is the fundamental cause of the present situation:

First—Over-production, caused by—

Second—The government's free-land policy, and—

Third—Its immigration system.

The tariff no doubt has an important bearing on the issue, but a still more potent influence is domestic taxation, and the combinations of buyers and transporters that largely govern the movement and prices of produce. An unbiased scrutiny of the last decade reveals the extent to which these influences have combined to cunningly divert attention from themselves by directing the public mind toward the tariff. The farmers at last seem to grasp the situation. While, like the workers in other industries, farmers hold widely divergent opinions as to the duty on imports, they are now unifying their efforts upon reforms relative to land, finance (including taxation), and transportation—the three great problems which in their multitudinous details affect so vitally the producers and therefore the welfare of the entire United States.

Instead of opening new lands to settlement, which would add abnormally to the over-production, the time has come to call a halt. The articles by Prof. Henry and Mr. Hale bear strongly on this point. And Mr. Carlisle hints at it in his reference to the proposed scheme for reclaiming the arid region. The conception of that vast enterprise reflects the highest credit upon the practical and scientific abilities of the director of the Geological Survey. We have shown also (AMERICAN AGRICULTURIST for November, 1889) that within two generations our present rate of production, even on this enlarged area, will barely supply our increasing population. But while it may be wise thus to provide for the future, no abnormal stimulant should be applied to the actual development of really new lands until the census of 1900 shows that agriculture has fully adjusted itself to the new conditions imposed upon it by the mushroom progress of the past quarter of a century.

Let population catch up with production. Let the comparatively small area of public land still unsettled be held in reserve. Let the now unworked but cultivatable areas in the various States be resettled. For the next decade this will afford an abundance of cheap lands to our own increase and such immigration as it is wise to foster. Let the farmer, meanwhile, see to it that he bears only his just proportion of the public burdens. Let him secure the home and foreign market for his own productions in such manner that the supply and the quality shall govern prices, rather than the dictates of any combination.

Such a policy, wisely administered, should make agriculture not only the most honorable, but, in a modest way, the most surely remunerative of all occupations. To effect this change demands not only better farming—better crops at less cost, better sales at greater profits—but the earnest fulfillment by the farmer of those political duties that are demanded of the citizen by every instinct of patriotism. The sound integrity, sturdy common sense, and the clear and sober judgment of an intelligent yeomanry were never more needed in public affairs.

Hiring Farm Hands.

In the matter of hiring help—the regular season's "hand"—farmers are at a disadvantage, as the contract is usually made. The hiring is generally done in the spring; the first of March or April in the North. The contract is for the season; that is, until the autumn work is finished, or to a specific date, as, say, November first. The wages to be paid are agreed upon at so much per month, with board. The wages being payable (and paid) each month, there is nothing to deter the employee from leaving at any time, except his sense of honor. Any pretext,—poor food, unreasonable hours of labor, etc.,—may serve as an excuse for leaving, no matter how busy the season, how much his services are needed, or how difficult it may be to secure other help. The farmer has no resource but to let his man go whenever the notion may take him, for an unwilling or dissatisfied hand is worse than none.

If, however, the farmer, finding that his hand is not satisfactory, wishes to dissolve the contract, he finds difficulties in his way. The contract was for the season, and the man will profess himself willing to remain and do his work. If discharged he may sue for the breach of contract, and it will be hard to prove that he has not performed his part of the agreement.

The farmer may protect himself against being left at any time, by a contract which should provide for the retention of a portion of the wages until the end of the season; with a forfeit of the same if leaving before the end of the season, or without due notice and consent.

Our method of hiring is somewhat at fault, also. In general it will be found that a certain price is established (with slight variations from it) throughout a certain district or community. This is done without much regard to the fact that some men are worth twice as much as others. If a farmer finds an unusually good man and pays according to his deserts, he is in disfavor with his neighbors, because such action will tend to raise the expectations of all the other hands, who consider themselves just as valuable. It is also considered wrong for a farmer to endeavor to secure the services of any one who is, or has been during the previous season, employed in that neighborhood. A farmer, having once employed a man, is considered to have some claim upon his services until he voluntarily relinquishes it.

While, as a rule, the relations between employee and employed, upon the farm, are those of mutual good-will and interest in each other's welfare, it would be better if the contract were more business-like, and compelled an appreciation on the part of each of the rights and just dues of the other. As in any other business relation, a man should be paid what he is worth; and there should be no unwritten law of public opinion to prevent a farmer from paying according to the quality of the service rendered.

A New Era.

The results obtained in the prize crop competition, conducted by this magazine during 1889, may almost be said to have marked a new era in American agriculture. They have certainly done much to stimulate farmers to a more profitable culture, and have commanded the admiration of the English-speaking world. The new potato contest for 1890, in which prizes amounting to several thousand dollars are offered, promises to be fully as exciting and beneficent. The plan of the new contest has been so simplified that every farmer who plants an acre of Irish potatoes can, without any effort above that required for a good crop, stand a fair chance of securing some of the remarkably liberal premiums offered. We shall be pleased to send to every person interested in potato culture a copy of the simple little book giving the details of the contest, upon application.

Is Agriculture Depressed?

If So, Why? What is the Remedy? These Questions Discussed by Some of the Leading Statesmen and Farmers of the United States.

PRESIDENT OF THE NATIONAL FARMERS' LEAGUE.

That there is a seriously depressed condition in our agricultural interests is acknowledged not only by those who are directly engaged in farming, but by many other business interests that are dependent upon the prosperity of the farming class. It is not local, but general; the same conditions are found in the New England States and in the far West, the Middle States and the South. The cause is to be found, to a certain extent, in the too great limitations and restrictions placed upon trade. Immense capitalized interests have grown up in our country that have been unnaturally stimulated; that have drawn off labor too largely in these directions; that have fixed the price of labor upon a scale that has drawn the best labor from the farm, and caused much of the poor and inefficient labor left to cost farmers altogether more than it is worth.

To this costly labor upon the farm is added the great productions of the soil of every kind, which, beyond our own wants, do not find the outlet as quickly and freely as they ought. There is too great a share of the burden of taxation resting on land. The protection of government is given to all kinds of property. Real estate, in many States, is carrying ninety per cent of taxation—altogether too heavy a proportion—and land and its products are sinking and depreciating under this unjust burden and share of taxation.

The remedy lies, first, for relief from these general causes, in farmers again (as in the earlier history of our nation) having more representation of their great interests in both State and National legislation, which they have largely lost. Secondly, farmers must study methods closer. Farming has been the best business (until it became crippled) in this nation, for out of it the wealth of the nation has been largely made; but much of this wealth has been made at the cost of the fertility of the soil. Hence, now, farmers must study to increase production, thereby reducing its cost, and, at the same time, to do this in such way as to not only conserve, but to add as much fertility to the soil as is taken from it. This calls for greater intelligence and skill in farming; it means the checking of the system of soil depletion which has so long been practiced; and that this can be done and, at the same time, make the business more profitable, there is no question. Intensive farm-

ing is the remedy. Increased production is justified by the rapid increase in population and extended markets. Above all, are needed high quality in everything; equality and justice to all interests; more brains in farming. These will, in time, dispel present depression and place our agriculture again on the way to greater prosperity.

GEORGE T. POWELL, Columbia Co., N. Y.

REPRESENTATIVE WILLIAM H. HATCH, MISSOURI.

"Is agriculture depressed?" Yes, below that of any universal and absolutely important industry within the present century; depressed to the lowest mark it will bear without absolute ruin to all engaged in it, and the inevitable creation of a political and social revolution to maintain its existence, and save the homesteads of millions of farmers. This depression is not sectional, nor is it confined to any one of our great crops. It embraces in its baneful effects all sections of our country, and every great crop grown, and every class of stock raised, except, in a limited sense, extra fashionably-bred blooded horses. It has produced the absolute abandonment of thousands of farms in the New England States, and the sale of thousands of others at prices so low as to arouse the State authorities of Vermont and New Hampshire, impelling them to a character of official advertisement for settlers from Europe, unprecedented in our history, and alarming to the perpetuity of our once prosperous condition as an agricultural people; and this in the most highly favored section of our country, as to prices and "home markets." This depression has caused the sale of the great crops of 1889 in Illinois, a Western State rich in all agricultural resources, at an actual loss to the growers, as officially stated, of many millions of dollars. In Kansas, corn is used for fuel because it is cheaper than coal. H. A. Heath, manager of the Kansas *Farmer*, recently said to a reporter of the Washington *Star*: "Out in Western Nebraska I saw millions of bushels o corn stacked on the soil from whence it had sprung, utterly useless because there was no profitable market for it. There is no money in feeding it to cattle or hogs, as prices are too low."

"And why is it?" Because, primarily, we are selling our surplus products in the open markets of the world, in competition with the cheapest agricultural labor and the lowest transportation charges in the world, and buying our ordinary implements and farm-machinery, as well as every manufactured necessity or comfort for our families, in the highest protected and most restricted market in the world, largely governed and controlled by trusts and combines. It is because we pay the highest transportation charges upon all our products of any nation with like advantages; because we foolishly imitated the monarchical governments of Europe in demonetizing silver, and thereby restrict our circulating medium in the interest of the money class, enhancing the value of money and depressing the value of farm-products; because we maintain a system of federal taxation skillfully and cunningly devised to place the burthens of the government unequally upon the masses of the people, the consumers, who are largely farmers, and to relieve capital and great corporations from their just share of these burthens, to enormously enrich the privileged classes at the expense of the masses; and which produces a surplus of revenue, still further restricting our circulating medium and inviting unnecessary and corrupt legislation. It is because the modern organization of boards of trade in the central markets have increased charges and multiplied expenses of middle-men, and have established and fostered a system of grain gambling—selling that which does not exist in competition with the actual crop grown, keeping up a feverish and unsettled market, and largely depressing prices. It is because the market price of our beef cattle is controlled by a syndicate or combination so powerful, absolute, and despotic, and so effectual, as to have completely destroyed competition among purchasers in this great industry. It is because the price of our fat hogs is fixed by the packers, and the price of the product, when manufactured, largely controlled and depressed by the same system of "gambling in futures." It is because our great dairy interest is subject to the competition of cheaper, mixed, manufactured products, the sale of which adds alone to the fortunes of the millionaire manufacturers.

"What are the remedies?" A reformation of our tariff laws, the restoration of some of the taxes upon capital, incomes, and wealth, and a corresponding reduction upon all articles of universal consumption and absolute necessity; and a reduction of the rate of taxation to the indispensable needs of the government, economically administered. The complete remonetization of silver, placing it on a perfect equality with gold as to coinage, bullion, and certificates, and a further enlargement of our circulating paper currency. Lower transportation charges, and any amendment to the Inter-State Commerce law that is just and necessary to accomplish this purpose. An amendment to the Constitution, if necessary, to outlaw and absolutely prohibit trusts and combines that control the prices of farm animals, and to declare "gambling in futures," or selling that which does not exist, a felony, and a rigid enforcement of the laws passed in conformity thereto.

REPRESENTATIVE ROGER Q. MILLS, TEXAS.

Agriculture is greatly depressed throughout the country, because of the small demand for its products. Our capacity for producing is constantly increasing, and at a greater ratio than our capacity for consuming the products of agricultural labor. The supply, therefore, is increasing faster than the demand; as a consequence, prices are falling until profits have about disappeared. What is the remedy? A greater demand for agricultural products, and that can only be had by free access to foreign markets. There are now two serious obstructions in the way to foreign markets. First, we prohibit the importation of the only things the foreigners have to give us in exchange for them, and the very things we want; and when we refuse to take their iron and steel, and cotton and woolen manufactures, they can't take our agricultural products. Second, France and Germany, that ha been taking large quantities of our breadstuffs and provisions, have put up high tariffs on our agricultural products in retaliation f r our high tariffs on their manufactures. The result is, our farm are compelled to buy manufactures a' high r prices and sell their products at lower pric s. Our agriculturists are about half of our total population. In 1881, we exported $672,000,000 f cotton, breadstuffs, and provisions, or about $26 per head of farming population. In 1889, we exported $464,000,000. With at least six millions more farming population, our exports were $200,000,000 less than in 1881. Now, if our exports last year had been at the average rate of 1881, they would have exceeded $800,000,000. If these two obstructions were removed, there would be an increased export over last year of more than three hundred millions. The increased demand for this large export would increase prices of all farm products at home from twelve to fifteen hundred millions, and that would distribute wealth and prosperity among all the farming people. These two obstructions would long ago have been removed but for the persistent determination of Northern and Western farmers that they should remain. If they now see, as they should, that no tariff can protect anything in the country where it is produced at its lowest cost, as are our agricultural products, and that they are laboring to enrich others and voting to impoverish themselves, and wish to labor in the future for their own benefit, they can easily remove the obstructions by electing Congressmen, Senators, and a President who are willing to represent their interests.

AN AGRICULTURAL SCIENTIST'S OPINION.

Some lines of agriculture are certainly in a depressed condition. Cattle and grain do not bring the cost of production. I consider the chief causes are over-production and restricted markets. The donation of immense tracts of lands by the government to settlers, and the sale of railroad lands at nominal figures, have contributed to the first cause. The settlement of these lands has been made possible and greatly stimulated by railroads, which have been built in advance of population, and which have taken every possible means to draw people along their lines. The enormous production of wheat through Dakota, Minnesota, and Manitoba, and the great corn crops of Iowa, Nebraska, and Kansas are the results of this movement. The marvelous improvements in agricultural machinery has greatly increased the productive power of every tiller of the soil. In the far West cattle have ranged on government, railroad, and Indian lands with little or no expense to the owners for the lands that fed them. A few years ago stock was bought in the Mississippi valley and shipped west to increase the herds, thus stimulating production; now this same stock and its descendants are coming back in direct competition with our own. As to outside causes, transportation facilities have equalized prices the world over to a degree never dreamed of before. There has been no notable failure of crops in any considerable portion of the world for some time. The whole world is practically at peace, and is producing more food than ever in the past.

Time heals all things. Population will gain on production. In this country, the new lands of first quality that exist in any body are about occupied. Constant grain production soon ruins the soil; rotation of crops and a higher grade of farming will soon break up the great wheat fields of the West, or their cultivation must cease. I believe the worst is already over in this branch of agriculture.

The range cattle business is gradually contracting and shifting its base, owing to the innovation of settlers and the destruction of natural pastures; winter feeding is becoming a necessity, and this calls for ownership of the cultivated lands, at least, and the growing of crops. These, with the longer distance from market, will put the Western meat-producer more nearly on a par with his Eastern brother.

So much for conditions which will right themselves. We must study to reach the consumer more directly. How can we expect paying prices for pork at the West when every pig is practically branded "Phil Armour's property" as soon as born? Intelligent producers must make high grade articles for a large class of consumers who have ample means to pay for such. What has been done with fine butter is possible with many other farm products. We must make our own sugar. It takes two-thirds of all the live stock sold in Chicago to pay our sugar bill. Let some of the present cattle-raisers turn their attention to sugar-beets, and both they and those who continue the stock business will be benefited. We must make pure, wholesome butter, cheese, pork, and beef. The words "American" or "United States" attached to any one of these articles should be sufficient guaranty of purity and healthfulness, and a password to any country. Our government should begin a vigorous study of the markets of the world, and open them up to our products wherever possible.

W. A. HENRY, Wis. Experiment Station.

REPRESENTATIVE JOHN G. CARLISLE, KENTUCKY.

That agriculture generally is not now, and has not been for several years, in a flourishing condition in the United States, is almost universally conceded. There are, doubtless, particular localities adapted to the production of special articles, in which the farmers are fairly prosperous, but a great majority of those engaged in agricultural pursuits are barely able to support their families and expend a sufficient sum annually upon their lands and buildings to prevent them from deteriorating. In many parts of the country they are not able to accomplish even this, and some have altogether abandoned the effort. The most successful realize but a small profit upon their investments and they will not long continue to do this unless present conditions are changed.

The causes which have produced this unfortunate state of affairs are many, and cannot be enumerated in a brief article; but the principal difficulties under which the farmers labor are high tariff taxes upon the articles they have to buy, the absence of a remunerative home market for their products, and the constantly-increasing competition in the foreign markets, where they are compelled to sell their surplus. The prices of nearly all the articles the farmer is compelled to purchase and use for the support of his family and in the cultivation of his land are artificially increased by the tariff taxes, while the articles he produces are sold by him in a glutted market at home or exported and sold in the open markets abroad, where prices are regulated solely by the law of supply and demand. In other words, he sells in a depressed and cheap market at home or in a free market in other countries filled with the products of his competitors from Russia, Hungary, India, South America, New Zealand, Australia, and other parts of the world where production costs not more than one-half what it costs here. By reason of the fact that our high protective tariff prevents the people of Europe, who have heretofore been the largest purchasers of our surplus breadstuffs and provisions, from selling us their goods, and, in that way, paying for what we sell them, they have, in recent years, sought their supplies else-

where, and are now procuring a great part of their wheat, beef, mutton, and other necessaries from the other countries mentioned. Besides this, our restrictive commercial policy has provoked retaliation upon the part of some of the European governments, and they now discriminate against our agricultural products in their markets. The competition from other countries will inevitably increase, and these discriminations against our products will be made more severe and injurious unless we show, by a change of policy, a disposition to trade with our oldest and best customers upon fair terms. If this is not done, the condition of the American farmer will grow worse instead of better; and, even with a change of policy in respect to foreign trade, if our own government enters upon the great scheme now pending in Congress to expend millions of dollars in the construction of dams and reservoirs for the irrigation of the vast arid regions in the West and Northwest, our agriculturists may expect to receive, in the near future, much lower prices than they are now receiving for their wheat, corn, beef, mutton, pork, and other products.

MASTER OF THE NATIONAL GRANGE.

Agriculture is depressed because of the low price for its products received by the farmer. The remedy is not easily pointed out, but I will suggest some measures of relief. First, if the present policy of the government is to continue, the American market should be secured to the American farmer by imposing a duty upon the agricultural products that are imported to be sold in competition for home products, that will afford ample protection to the American farmer. Prohibit gambling in farm products. Also, prohibit all adulterations which deceive and disgust the consumer, and injure the sale and reduce the price of the farmers' products. Compel all exporters to brand their goods so that foreign consumers may know just what they are buying; this will increase consumption and cannot injure the dealer in honest goods. Equalize and reduce the burden of taxation, local, State, and national. Increase materially the amount of money by coining silver to the extent of at least five millions of dollars per month. Prohibit the formation of trusts and combinations calculated to prevent fair competition, and to thus build up unreasonable profits for the few at the expense of the many. Revise the tariff and reduce duties when too high and increase when too low, and thus encourage the production of much that we buy from other countries. Squeeze the water out of the railroad stocks and require good service at reasonable cost. Reduce the fees and salaries of officials to correspond with the decreased cost of living and the price of skilled labor on the farm. Punish extortion by professional men, and thus protect those who are unable to protect themselves. These are some of the remedies, but there is another important one which the farmer must prescribe for himself and family—reduce expenditures to the lowest point consistent with the preservation of health, until debts are paid and interest ceases to absorb all the results of his labor. Pay as you go in future, and never depart from the rule. Then the farmer can look the whole world squarely in the face, and need not struggle to increase a production which pays no profit. Then he can crush trusts, and to some extent fix the price of his products.

J. H. BRIGHAM, Fulton Co., Ohio.

SENATOR G. C. VEST, MISSOURI.

That agricultural interests are depressed does not require argument. The value of property is fixed, as a general rule, by the income it produces, and the depreciation in the value of farming lands in all parts of the country proves beyond question the depression of agriculture. Farming lands bring each year lower prices, for the simple reason that not one of the staple farm products brings a profit over the cost of production, there being included, of course, in this cost the usual per cent on the amount invested. Senator Gerard C. Brown, of York Co., Penn., testified lately before the Ways and Means Committee of the House of Representatives that, although the farmers in his section were among the most intelligent in the country, near to home markets, temperate and frugal, yet they have been able to survive thus far in the prevalent depression only by living on the funds they had accumulated during the previous prosperity of agriculture, but that these funds are now mostly exhausted. Mr. Brown stated that this was the situation throughout Pennsylvania. In New England, many farms in the immediate vicinity of the manufacturing towns are offered for any price to be had, while others are abandoned. In the West, agricultural lands are steadily falling in price, and farm products are abnormally depressed. In Kansas, corn is being burned for fuel in some counties, and its selling price, when a purchaser can be found, is fifteen cents per bushel. In the same State, wheat brings fifty-five cents, oats ten cents, potatoes twenty-two cents, fat cows and heifers one and one-half cents per pound on the hoof, and hay $2 per ton. Beef cattle of the best grades do not pay the raiser for his corn, grass, and labor, without counting the interest on the purchase money. I know this from the testimony taken before the Senate Committee on Meat Products, of which I am Chairman.

The cause of this unnatural condition is found in the fact that we are stimulating manufactures by a high protective tariff at the expense of agriculture. As the cost to the farmer of what he does not raise is increased, the receipts for what he raises are decreased. He is producing for the manufacturer and capitalist, not for himself. The laws, ostensibly made to protect all classes alike, only protect manufacturers, while the farmer, who furnishes the exports, cannot be protected because his exported products sold in foreign countries regulate his home prices. If one organ of the human body is unnaturally stimulated it must be at the expense of the other organs, and the same rule obtains in the economic conditions of the body politic. In either case there results disease. The great remedy for the diseased condition of agriculture is to lower the tariff on imports. Destroy the trusts and combines which are now bleeding the farmer to death, by removing the tariff wall that keeps out foreign competition, and allow commerce and production their natural course. The home market, such as it is, will not run away, nor will the factory operatives become farmers.

EX-MASTER CONNECTICUT STATE GRANGE.

As to the reasons for the depression in agriculture, shall I say too much rich and fertile land at the West, and overproduction of staple crops, as a general cause; or, rather, make the specific charge, which I do, that the general land policy of our government, and a too unrestricted immigration, are largely to blame for the whole trouble. Thousands of European farmers have been coming to our shores year after year, and the government has, practically, almost set them up in business in competition with our own farmers. Is it any wonder that agriculture is depressed? Suppose the government had furnished almost free factories, warehouses, stores, steamboats, and railroad trains to foreign manufacturers, merchants or capitalists who might come here. Would there not have been a good solid "kick" from our citizens interested in those industries?

The farmer has not yet learned to mind his own business. That's one great reason why agriculture is depressed. Another reason i hat there is such a wonderful lot of independence in farm-life; a farmer and his family can manage to exist without depending on others; therefore, the same study, co-operation and combinations that have so aided other industries have not been applied to agriculture until recent years. Even yet so few farmers avail themselves of these methods that their effects are largely local. Still other causes are high rates of interest, and an undue share of the burdens of taxation.

"What is the remedy?" First, a thorough knowledge of his business by the farmer—not simply a knowledge of how to grow crops, but, rather, how to sell them. A knowledge that will show actual cost of production; enough of bookkeeping to show what crops are continually being sold below cost, and then applying that knowledge to practical use. In fact, more and better business methods on the farm are what is wanted. This can only come about through the individual effort of each farmer, aided by the Grange, Experiment Stations, Agricultural Colleges, and the agricultural press. Association and study of and with these will show the farmers how really dependent they are one on the other, and how much can be gained by such association and co-operation. Understanding our own position better, and our relation to all other industries, we shall then be in position to so regulate public matters as to relieve agriculture of the burdens that have unintentionally been put upon it, largely because farmers, as a class, have taken so little interest in public affairs. I have little faith in making agriculture profitable by legal enactment, until the farmer himself comes to a realizing sense of the source of his trouble.

J. H. HALE, Hartford Co., Conn.

SENATOR JOHN H. REAGAN, TEXAS.

Mr. Reagan was too busy to write his views in detail, but says: "The agricultural interests of the country are greatly depressed, by reason of class legislation, and especially of the high protective tariff, and of legislation hostile to free silver coinage."

New Publications.

THE PRACTICAL HORSE-SHOER: Compiled and edited by M. T. Richardson.

There is probably no other mechanical art so universally practiced as horse-shoeing about which its practitioners have so little knowledge and skill. A sound, healthy foot is the very foundation of all practical excellence in a horse, yet it is notorious that a perfect foot is rarely found on a horse which has worn shoes for any considerable time. With a just view of the importance of the subject, the "Blacksmith and Wheelwright" invited contributions from practical horse-shoers and published them, with illustrations where needed. From this mass of the literature of horse-shoeing, the editor has collected and classified the contents of the volume under notice. As may well be supposed, there are some clashing opinions, which the editor has made no effort to harmonize. But it abounds in practical suggestions, and no horse-shoer or horse-owner can fail to find much profitable reading in its pages. Sold by the Orange Judd Co.; price $2.

THE HORTICULTURIST'S RULE-BOOK; a Compendium of Useful Information for Fruit-Growers, Truck-Gardeners, Florists, and others. Completed to the close of the year 1889. By L. H. Bailey. Garden Publishing Co., Limited.

It is difficult to conceive how a greater amount of practical, every-day information relating to fruit and vegetables could be condensed into smaller compass than is contained in this little manual. Insects and insecticides; fungous diseases, and heir remedies; waxes for grafting; cements, mortars, and paints for horticultural structures; tables for ready reference in regard to the amount, time, and methods of sowing seeds; methods of storing and keeping fruits and vegetables; these, and many other things of great value, are clearly set forth. Prof. Bailey is both thoroughly scientific and thoroughly practical. There are many single pages, each one of which contains practical information worth more to any gardener or orchardist than the price of the book. Sold by the Orange Judd Co. Price $1, prepaid.

MERE MENTION.

Twenty-First Annual Report of the State Board of Agriculture, Missouri, 1888-9. This report is of exceptionally high value, especially the portion devoted to the subject of public roads.

Uncle Sam's Farm. The reclamation of the arid region of the United States by means of irrigation. By Joseph Nimmo, Jr. An interesting pamphlet of 41 pages, accompanied by a map of the arid region.

My Handkerchief Garden. The Garden Publishing Company, Limited, publish this little brochure from the prolific pen of Charles Barnard, whose previous works are widely known among lovers of flowers and fruits.

Illinois Horticultural Report for 1889. We have received a copy of this report through the courtesy of Secretary A. C. Hammond. It contains, like others of the series, the proceedings of the State and the local horticultural societies.

Hand-Book of Cheese-Making, by Geo. E. Newell. The author of this work is a practical cheese-maker and has written much for the agricultural press. He has condensed into the fifty-nine pages of the pamphlet a great many facts and hints which possess much value to any dairyman or cheese-maker who will read it intelligently. Sold by the Orange Judd Co.; price 50 cents.

Dance's Veterinary Tablet. This is a compendious chart, in which are presented in columns the common diseases of domestic animals, the symptoms and remedies. At the foot is a list of recipes for the remedies. It is mounted on muslin, and folded into a neat cover, in the form of a pocket-map. Prepared and published by A. A. Dance, Spokane Falls, Washington. It is quite a treasury of information for every one having horses, cattle, or dogs.

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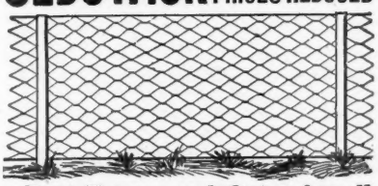

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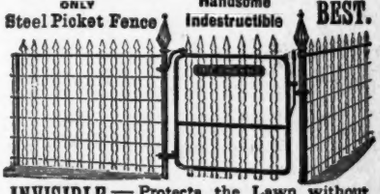

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THE NEW POTATO CONTEST.

How Best to Apply Stable-Manure.

The Methods of Several of Last Year's Contestants that May Prove of Value to All in the New Potato Contest of 1890.

J. F. Foster, Cortland Co., N. Y.—Twenty-five two-horse loads of stable-manure and thirty two-horse loads of hog-manure were applied, each load containing twenty-five bushels. The latter was made from horse-manure being thrown in the hog-yard as often as was required to take up the liquid of thirteen pigs that had been kept through the winter and summer of 1888. This was broadcasted over the acre, the stable-manure being applied as fast as made from the seventeen cows that had been fed daily four quarts of corn-meal and all the hay they would eat during the winter of 1888. In addition to this, 1,700 pounds of potato phosphate were applied, which analyzed four to five per cent of ammonia, five to six of available phosphoric acid, and ten to twelve per cent of actual potash. The manure was applied by two men with common manure-forks, as evenly as possible. The cow-manure was spread in the winter, and the mixed horse- and hog-manure was spread over the cow-manure before plowing, being well harrowed in. The fertilizer was applied in the drills by one man scattering it evenly, using a ten-quart pailful per row of 180 feet. No dirt was thrown over the fertilizer. One man followed the fertilizer man along with the seed potatoes, and they were covered immediately.

A. A. Ten Eyck, Green Co., Wis.—Forty loads of stable-manure were applied to the contest acre as soon as it was free enough from frost to handle easily. It was made from horses and cattle fed on cut corn fodder and oats, and was worth about fifteen to twenty-five cents per load, the cost of hauling being about twenty-two and one-half cents per load. It was thrown in a pile at the stable as soon as made, and drawn to the field, where it lay until ready to plow in, when it was at once spread and plowed under with about thirty-five loads from the hog-pen. In addition to this, about 100 bushels of ashes were applied, a part of which were leached, while the greater part was thrown out on heaps mixed with coal-ashes. This was applied after planting and harrowed in. After the potatoes were up two or three inches, 200 pounds of plaster mixed with one and one-half pounds of Paris green were applied about June 1st and July 3d. The stable-manure was plowed under, and the hog-manure applied on top with the ashes.

Robert C. Nisbet, Rio Grande Co., Col.—Twenty-four tons of cow-manure was applied to the contest acre, the value of which was about twenty-five cents per load. The manure consisted of the droppings of the milch cows for eighteen months, mixed with about ten per cent of straw. It was but partially rotted, as in the dry climate of this section, where the moisture is very limited, it is difficult to rot the manure. No commercial fertilizer was used, on account of the contestant living so far away from any fertilizer market. The manure was applied broadcast as evenly as possible before plowing, then plowed in. The contestant believes this is the best way of applying manure in such a dry climate, as, if it were applied in the hill or row, it would create too much heat, and burn the young roots. In the latter case, also, it would require extra care in irrigation.

John G. Brand, Jefferson Co., O.—The manure applied on the contest acre consisted of forty loads made from horses, cows, and hogs that had been fed on hay, corn, oats, middlings, and straw. The hauling took two days, March 15th and 16th, and cost six dollars. The value of the manure, at twenty-five cents per load of one-half ton, was ten dollars. The manure was green and had had no extra treatment. It was broadcasted from the wagon with a manure-fork.

Oliver Sancomb, Clinton Co., N. Y.—About twenty-five loads of stable-manure, each containing thirty-four cubic feet, were applied early in the spring, from cows and horses that had been fed hay, straw, and potatoes. It was worth seventy-five cents per load, and the cost of drawing was about four dollars. The manure was voided by the stock during the previous winter, and was thrown into the barn-yard—the stables being cleaned each day—and remained there without further treatment, and unsheltered until used. It was broadcasted by hand with a dung-fork from the wagon before the spring plowing.

George W. Fortune, Lorain Co., O.—Twenty loads of stable-manure, consisting of about twenty bushels to the load, were applied March 24th, 1889, from cows and horses that had been fed hay, oats, and corn-stalks. The fair cash value of the manure applied at the barn was $4, and the cost of hauling and applying to the land was $6. The manure was about six months old. From the time it was voided by the stock until it was incorporated in the soil, it was thrown in the barn-yard in a pile, and was turned once. In addition to this, fifty bushels of unleached wood-ashes were used, being applied May 26th, the cost of which was $3.50, and for applying $1.50. The manure was wholly broadcasted, this process being done with a fork, and then plowed under. The ashes were wholly broadcasted with a shovel after the land was plowed, and before dragging. The stable-manure was not very well rotted.

Ray Greene, Whiteside, Ill.—About twenty cubic yards of cow-manure was applied the last of February and first of March, made from cattle that had been fed on hay and corn-stalks that had been put through a Keystone husking and cutting machine. The value was twenty-five cents per yard at the time it was applied to the land. It was taken daily from behind the cattle and spread upon the land. The manure was spread broadcast from the wagon with a six-tine fork before the crop was planted.

Albert Pearce, Lorain Co., O.—Five one-horse loads of well-rotted barn-yard manure were applied, on May 2d, 1889, made from stock that had been fed corn-stalks in the bundle. The value of this fertilizer was about $2.50 per load of eighteen bushels, and the cost of hauling and applying to the land was seventy-five cents. The manure was one year old, and had been pitched into a pile as fast as made, where it remained until used. It was top-dressed and dragged in by means of fork and shovel.

B. G. Calvin, Madison Co., Ill.—Seventy-five loads of about forty bushels each of well-rotted barn-yard manure were spread upon the surface before plowing in the spring. This work was done in about four days' time by two men and team. The value of the manure was $1 per load, and the cost of hauling and applying to the land was $12. It was one year old, having been hauled from the yard in the fall of 1888, and left in a large, flat heap through the winter of '88-'89.

J. N. Muncey, Buchanan Co., Ia.—Thirty-nine loads of cow-manure were applied, weighing 74,720 pounds net, March 31 and April 1, 1889. The cows had been very liberally fed on ground corn, ground oats, and bran, mixed in the proportion of fifty-six pounds of corn, sixty-four of oats, and fifty pounds of bran; also, timothy hay. At a rough estimate the manure was valued at $18.50, and the cost of hauling and applying to the land was $6.75. The manure was wheeled from the stables every day and dumped into a large pile, where, in an open yard, it remained exposed to the weather until applied. It was spread evenly by forks from the wagons at the time of hauling.

Answers and Suggestions.

C. A. Duke, McKean Co., Penn.: The acre may be of any form desired, so long as it contains only 43,560 square feet. The outside rows must not be nearer than twelve inches to the boundary line.

Cutting potatoes for seed: Three fair-sized tubers weighing one pound will usually contain about 40 eyes, so that 100 sets of two eyes will weigh about four and a half pounds, and a bushel of sixty pounds will give about 1,200 sets of two eyes. Mr. Rose is satisfied, from half a century's experience, that this is the best size for planting for a crop for table use, and points out that larger and heavier tubers will not contain any more eyes. The majority of the contestants last year held to this opinion.

H. J. Langdon writes from Cottonwood, Cal.: "I am greatly interested in the reports of the prize crop contest, and have learned much from them. I think it is a grand idea, and believe that the new potato contest for 1890 will be of vast benefit to farmers. Let me add that my father commenced taking the AMERICAN AGRICULTURIST for me when I was a little boy going to school in Buffalo, N. Y. He took it until his death, and you can continue sending it to my address until you hear of my death, and there will be enough left then to pay you what is due, if anything. I consider any one copy of the AMERICAN AGRICULTURIST fully worth its cost for a whole year."

A point about Capt. Z. J. Drake's great corn crop of 254 bushels forty-nine pounds of shelled corn on one acre of 43,560 square feet, which took the AMERICAN AGRICULTURIST grand prize of $500 and a like prize from the South Carolina Department of Agriculture, was not covered in the very complete report of this crop published in the AMERICAN AGRICULTURIST for March. "The appearance of the corn when green was like half a dozen sugar-cane patches piled up on top of each other. Mr. Drake built a frame scaffold in amphitheatre style, so that curious multitudes could mount up and behold 250 bushels of corn growing on a single acre."

Enoch Auten, Cedar Co., Iowa: The special fertilizer prizes are offered for the best crops grown exclusively on the Mapes or Stockbridge manures. This means just what it says. The crop or crops to secure these prizes must be grown without the addition of other fertilizers or manures. Any field that has received stable manure the past fall or winter (since October 1), or this spring, will be ruled out so far as the fertilizer prizes go; but plaster, salt, sulphur, and water (the latter either by irrigating or mulching) are permitted. So far as the AMERICAN AGRICULTURIST regular prizes are concerned, there is no restriction whatever as to manures, cultivation, or variety.

To have smooth tubers: Put thirty pounds of sulphur in a tub, stir in with it a bushel of unslaked lime, pour in hot water and let it slake. Add enough unleached ashes to dry the mixture off, and stir in a few pounds of coarse salt. This mixture is scattered in the furrows after the potato sets are dropped, and the whole covered with soil. Mr. Rose testifies that where he uses such a dressing, the crop is always smooth, though adjoining rows to which it is not applied are usually scabby. Clear sulphur has also been used experimentally by some with similar results in some cases, and no good effect in others. Mr. Rose places great stress on having the sulphur slaked with the lime. For mildew, he sprays the leaves on both sides with a solution of five pounds each of lime and sulphur slaked together and dissolved in sixty gallons of water, and adds that "this will positively kill the mildew if the weather is fair."

James V. Wood, Butler Co., Neb., writes: "The report of the famous $1,000 prize corn crop is very interesting. The New South seems to carry off the prize on the average yield—95 bushels from the fourteen Southern States, against 89 11-17 bushels from the East, and 89 2-7 bushels from the West. The contest crops of the New South seem to be gotten up regardless of expense, as do the crops of the Eastern States, while the crops grown in the Western States (with a few exceptions) seem to have been raised at little cost—almost in poverty; showing a lack of knowledge as to what fertilizers to use for corn, or a lack of funds." An article on this point will be one of the features of our May number. The preliminary calculation shows that the average expense per acre on the fourteen Western prize crops was $34.56; on the fourteen Southern crops, $71.56; on the seventeen Eastern crops, $83.72. On this basis, the total gross cost of production, per bushel of crib-cured corn, was forty cents for the Western, seventy-five cents for the Southern, and $1 for the Eastern crops. It should be added, however, that a large credit is to be allowed all the Eastern and Southern crops on account of the amount of plant-food supplied to the soil in excess of that carried off by the crop. What this value is in each case will appear in the article referred to.

Acclimating the potato: Mr. Rose testified that potatoes grown for three years or longer on his farm in Yates Co., N. Y., have almost invariably yielded larger crops when used for seed than tubers brought from a distance. It takes foreign varieties two or three years or even longer to get acclimated, and the wild potato still longer. He secured one tuber of the wild potato as it grows in South America, and for four years got from planting it only one tuber annually, about the size of a small pea. The fifth year it increased in size and number, and the sixth year there were enough to plant half an acre, which yielded 320 bushels. In 1888 Mr. Rose says this now civilized variety yielded 787 bushels per acre, many weighing two pounds, and it (Early Peruvian) was the best yielder on the contest acre last year. President Smith obtained his Early Ohio seed about twelve years ago, since which time he has changed the ground yearly, but.

(*To Page* 226.)

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"Dr. Haas' Hog Remedy is a certain preventive of Disease, making pigs thrive well and gain flesh fast."

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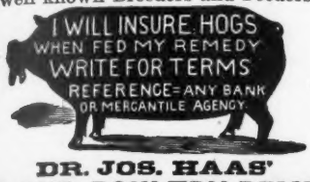

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Orders by mail receive prompt attention. Write for circular. Send 2 ct. stamp for "Hogology," a 64 page pamphlet on swine. Mention this paper. **JOS. HAAS, V.S., INDIANAPOLIS, IND**

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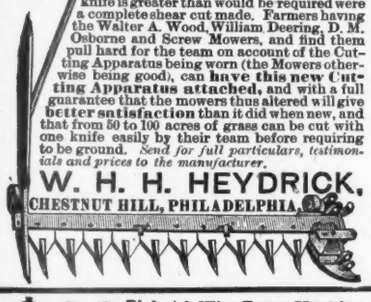

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ACT LIKE MAGIC
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OF ALL DRUGGISTS.

This is the strongest, cheapest and best Butter Color ever made or sold in any market. A 25-cent bottle will give the finest June tint to 500 lbs of winter butter. Send for circulars and prices if your dealer don't keep it.

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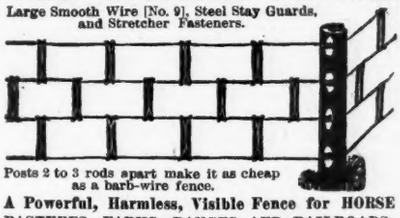
THE DUNCAN FENCE.

Large Smooth Wire [No. 9], Steel Stay Guards, and Stretcher Fasteners.



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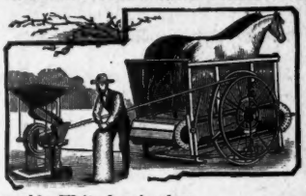

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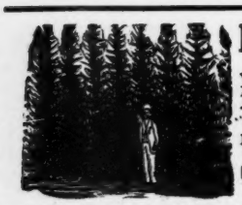

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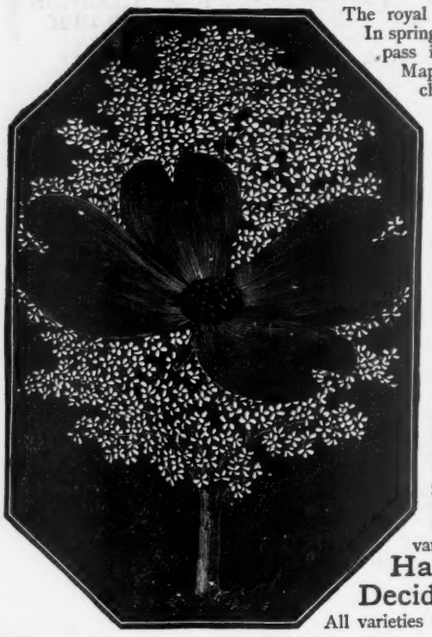

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PRICE:

BUSHEL, **$1.** 5 BUSHELS, **$4.75.** 10 BUSHELS, **$9.25.**

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Largest Stock in America.

All Dakota-grown, heavy yielding. Price, from **$2** to **$3** per big full bbl.

Freights from Lacrosse Low. Send now, so goods reach you in plenty time.

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HERE IS A LIST THAT WILL GIVE SATISFACTION:—**Red Cross Tomato**—resembles Livingston in form, solidity, color, etc., but is decidedly earlier. **Ignotum Tomato**—round, solid and productive; both Rural New Yorker and Prof. Taft have a special good word for Ignotum. **Gragg Watermelon**—a distinct variety, flesh salmon-color, quality and flavor peculiarly rich and sweet. **Marblehead Early Marrowfat**—a remarkably strong grower, a tremendous cropper, and bears several pickings. **Early Prize Pea**—cross between Tom Thumb and Advancer; dwarf, early, and a splendid cropper. **The Favorite**—a better Pea than either Abundance or Everbearing. **Ford-Hook Squash**—dry, fine-grained, sweet, hardy, prolific. **White Prolific Marrow**—a new English dwarf, wrinkled Pea, a wonderful cropper. **Giant Pascal Celery**—stalks extra large, solid, and a better keeper than other self-blanching varieties. **Cylinder Wax Bean**—the rust and blight-proof Wax Bean so long sought for. **Coral Gem Pepper**—with its hundreds of brilliant red pods, it is as brilliant as a gem. **Blonde Block-Head Lettuce**—a rich, golden-headed Cabbage, crisp and fine. **15 cents** per package; **Ten** for **$1.00.** An extra package to all naming this paper. Seed catalogue **free.** **JAMES J. H. GREGORY, Marblehead, Mass.**

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Headquarters of the **MOYER,** the Earliest, Best, Reliable Red Grape. Also **SMALL FRUITS, TREES,** etc. 3 sample vines mailed for 15 cents. Illust. descriptive Price List free. **LEWIS ROESCH, FREDONIA, N. Y.**

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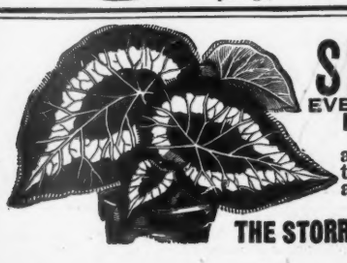

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TOMATOES BEAUTY FAVORITE PERFECTION ACME PARAGON POTATO LEAF GOLDEN QUEEN

Lorillard Tomato.

Introduced by us last season, is the most solid and delicious variety grown; unequalled for forcing or garden culture. For 15 cents we will send, post paid, a pkt of the original grower's seed, and our illustrated catalogue.

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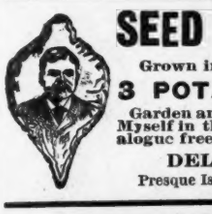

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Grown in the town that won

3 POTATO PRIZES!

Garden and Field Seeds grown by Myself in the cold Northeast. Catalogue free.

DELANO MOORE,

Presque Isle, Aroostook Co., Maine.

THE NEW POTATO CONTEST.

(*From Page 222.*)

not the seed, and thinks the potatoes are larger, with a greater proportion of smooth ones among them, than at first, while the yield is certainly no less.

The Rules of the Contest.

1. Each contestant must be a paid subscriber to the AMERICAN AGRICULTURIST. Those whose subscriptions are paid for only to October, 1890, or to earlier dates, may contest upon renewing their subscriptions. All subscribers whose land is in North America may compete, no matter whether they subscribe directly or through agents who are working for the liberal prizes offered in the AMERICAN AGRICULTURIST Premium List for 1890, or through other papers. New as well as old subscribers may compete.

2. Those who won prizes in the potato class of the AMERICAN AGRICULTURIST Prize Crop Competition for 1889 cannot compete in this new contest.

3. To enter the contest, subscribers have only to notify the AMERICAN AGRICULTURIST that they propose to try for the prizes. This may be done by letter or postal-card, but such notices must be given before July 1, 1890, at latest.

4. The land must be just one acre (43,560 square feet), carefully measured by a surveyor before, or within thirty days after, planting, whose affidavit (made before a justice of the peace or notary public) will be required on the certificate for the purpose provided on Page 2 of the Book for Reports.

5. The hills or rows must be at least twelve inches from the boundary line of the acre. Only one crop from one planting will be counted; no second planting between the original rows or hills will be permitted. Sweet potatoes cannot compete.

6. The AMERICAN AGRICULTURIST must be notified at least two weeks before the proposed date of the harvest, so that its representative may be present, if possible.

7. The harvesting must be done in the presence of three disinterested witnesses. They must measure the land carefully, and, if not satisfied that it is the exact and original one acre, they will have it measured by a sworn surveyor. The witnesses must supervise the weighing of the crop. Their signatures, under oath, must attest the honesty and correctness of the contestant's report, on the certificate provided for the purpose in the Book for Reports.

8. A complete record must be kept of the crop, and must be given in the blank pages provided for the purpose in the Book for Reports. This can be done by answering, in the order named, the questions asked in the printed pages. Thus, the work of making out the report will be very simple—just answer the questions.

9. These reports must be made in the Book for Reports, which, with the report so made, must reach the AMERICAN AGRICULTURIST on November 5th, 1890, at the latest, and as much earlier as possible. A copy of the Book for Reports will be furnished free upon application.

10. The first of the AMERICAN AGRICULTURIST prizes will be awarded for the largest yield of potatoes in a single crop, on one exact acre, as reported in accordance with these rules. The second prize will go to the second largest crop, and so on. The special prizes will be given in order of value for the succeeding largest crops, except when special conditions are imposed, as in the fertilizer premiums, and some premiums offered in conjunction with ours by agricultural societies. These will be awarded according to the terms specified in the offer. All such offers, and the complete list of premiums offered, will be found in the present and later issues of the AMERICAN AGRICULTURIST.

The List of Prizes.

THE AMERICAN AGRICULTURIST PRIZES.

FIRST—The AMERICAN AGRICULTURIST Grand Cash Prize for the largest yield of potatoes on one acre, in accordance with the above rules.... $200.00

SECOND—The AMERICAN AGRICULTURIST Cash Prize for the second largest yield on one acre... 150.00

THIRD—The AMERICAN AGRICULTURIST Cash Prize for the third largest yield on one acre..... 100.00

FOURTH—The AMERICAN AGRICULTURIST Cash Prize for the fourth largest yield on one acre.... 50.00

SPECIAL PRIZES.

WYOMING.—The Legislature has passed an act providing that if the AMERICAN AGRICULTURIST prizes are taken by farmers in that Territory Wyoming will give in addition (further particulars are given in the Wyoming press and by F. W. Isham, Little Bear, Wyoming)..... 1000.00

MAPES CO.—If the AMERICAN AGRICULTURIST grand cash prize for the largest yield of potatoes on one acre goes to a crop grown exclusively on Mapes Potato Manure, the Mapes Formula and Peruvian Guano Co., of 158 Front street, New York city, will give Six Hundred Dollars, making the total cash obtainable for the first prize crop under these circumstances 800.00

MAPES CO.—Provided the above premium is not taken, the Mapes Formula and Peruvian Guano Co., of 158 Front street, New York, will give $600 in gold coin for the first, second, third, and fourth largest yields of potatoes grown in this competition with the Mapes Potato Manure exclusively: First prize, $225; second prize, $175; third prize, $125; fourth prize, $75. Total..... 600.00

BOWKER FERTILIZER CO.—If the AMERICAN AGRICULTURIST grand cash prize for the largest yield of potatoes on one acre goes to a crop grown exclusively on the Stockbridge Potato Manure, the Bowker Fertilizer Co., of 43 Chatham street, Boston, will give $600, making the total cash obtainable for the first prize crop under such circumstances..... 800.00

BOWKER FERTILIZER CO.—Provided the above premium is not taken, the Bowker Fertilizer Co., of 43 Chatham street, Boston, will give $600 to the party who shall raise on Stockbridge Manure exclusively a larger crop of pototoes on a single acre than that which took the Grand Prize on Stockbridge Manure in the 1889 contest, viz., 738½ bushels..... $600.00

BOWKER FERTILIZER CO.—Provided the above premiums are not taken, the Bowker Fertilizer Co., of 43 Chatham street, Boston, will give $600 in prizes, to be divided as follows, for the largest yields of potatoes grown exclusively on Stockbridge Potato Manure, viz.: First prize, $225; second, $175; third, $125, and fourth, $75; aggregating 600.00

NEW YORK STATE AGRICULTURAL SOCIETY.—This society has appropriated $500 for special premiums for the best potato crops grown by New York State farmers in the AMERICAN AGRICULTURIST potato contest for 1890. The Executive Board meets before April 1, to arrange the details of this offer, which will be such that every large crop in the State may secure some of the money offered by this enterprising society. The official announcement of the plan adopted by the board will be published in the society's premium list (which may be had of Hon. J. S. Woodward, Secretary, Albany), and in the agricultural and weekly press..... 500.00

VERMONT STATE AGRICULTURAL SOCIETY.—If the AMERICAN AGRICULTURIST first prize of $200 for the best acre of potatoes is taken by a Vermont farmer, the Vermont State Agricultural Society (Col. George W. Hooker, president, Brattleboro) will give, in addition to it, $300, making the total cash obtainable for the best acre of potatoes, if grown in Vermont..... 500.00

Provided the above premium is not taken, the Vermont State Agricultural Society will give $200, divided into prizes respectively, for the five largest crops grown in that State, of $100, $50, $25, $15, $10, or a total of..... 200.00

ASPINWALL POTATO-PLANTER.—If the AMERICAN AGRICULTURIST grand cash prize goes to potatoes planted by the Aspinwall Potato-Planter, the Aspinwall Mfg. Co., Three Rivers, Mich., will give, in gold coin, $210 and one Aspinwall Potato-Planter, with Fertilizer and Corn-Planter attachments all complete, listed at $90; making a total of..... 300.00

POTATO-DIGGER.—If the AMERICAN AGRICULTURIST grand prize goes to potatoes dug exclusively with one of Rigby's Patent Improved Potato-Diggers, manufactured at Houlton, Me., and Upper Stillwater, Me., by Rigby & Burleigh, price $30, they will give an additional prize of.. 200.00

JOHN A. SALZER, LaCrosse, Wis., for the largest yield of Salzer's new Gov. Rusk potato grown in the AMERICAN AGRICULTURIST potato contest, $50 in gold. Second prize, $25 worth of seed, the prize-winner making his own selection from Salzer's Northern-grown seeds. Total..... 75.00

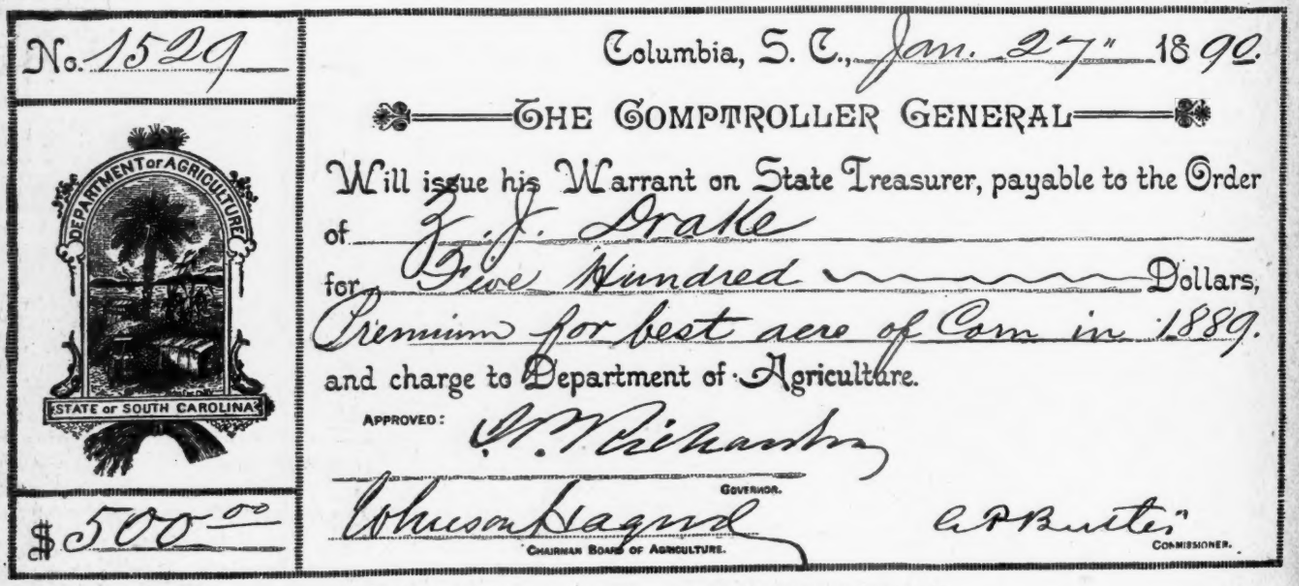
Similar prizes on Salzer's Ironclad potato..... 75.00

C. E. ANGELL, Oshkosh, Wis., if first prize goes to a crop from his seed, will give..... 50.00

HOY POTATO-DIGGER.—For the largest yield in this competition on commercial fertilizers, any brand, the International Seed Co., Rochester, N. Y., offer a Hoy Potato-Digger, price..... 65.00

WILLIAM DEERING & CO., Chicago, Ill., offer one of their New Deering Mowers, furnishing a machine cutting either four or four and a half feet, and with cutting sections either two and a quarter or three inches, as the winner may elect.

SEEDS.—For the largest crop grown in this competition in Aroostook Co., Me., Delano Moore, Presque Isle, offers a selection from his seed catalogue for 1891, to the amount of..... 25.00


No. 1529
Columbia, S. C., Jan. 27" 1890.
THE COMPTROLLER GENERAL
Will issue his Warrant on State Treasurer, payable to the Order
of F. J. Drake
for Five Hundred Dollars,
Premium for best acre of Corn in 1889.
and charge to Department of Agriculture.
APPROVED:
GOVERNOR.
CHAIRMAN BOARD OF AGRICULTURE.
COMMISSIONER.
DEPARTMENT OF AGRICULTURE
STATE OF SOUTH CAROLINA
$500 00

A SOUVENIR OF THE CROP COMPETITION.

In addition to the American Agriculturist Prize of $500 for the largest yield of Corn on one acre (255 bushels), Mr. Drake captured a similar prize ($1000 in all) offered by the South Carolina Department of Agriculture; the above being a fac-simile of the order for payment.

EARLY MASTODON CORN.

The Greatest Yellow Dent Field Corn in America.

First offered in our 1889 catalogue, but already planted by more than ten thousand of the most progressive farmers in the country. Last year, Alfred Rose, of Yates Co., N. Y., raised from our seed 191 bushels of Early Mastodon on one acre: Geo. Gartner, of Pawnee Co., Neb., succeeded in raising 151 bushels of Mastodon on one acre. (See page 123 of the March AMERICAN AGRICULTURIST.)

——*WHAT WE CLAIM FOR MASTODON CORN.*——

We claim for this corn the largest number of rows on cob, and longest and biggest ears of any corn ever originated. That it fully withstands the rigor of our Northern climate (witness Mr Rose's crop) and grows very strong and rank in all soils and under all conditions. To convince the readers of this paper of its earliness, would say, our seed was grown and ripened in 100 days within 8 miles of Lake Erie; fields planted June 1st were cut September 15th. That it is absolutely the most productive Yellow Dent Corn the World over.

We will only add, if you wish to be abreast of the times, you must put in a few acres of Mastodon in 1890. Not a reader of the AMERICAN AGRICULTURIST should miss this opportunity of planting the most improved Yellow Dent Corn in America. A corn sure to outcla s any other variety at present grown.

Prices on Early Mastodon for 1890: *Packet 10 cents; pound 50 cents; 3 pounds $1 by mail postpaid. By express or freight, purchaser to pay freight, peck $1; bushel $2.50; two bushels $4; 10 bushels $18.75.* No charge for bags. To secure the genuine, buy your seed direct from the introducer and headquarters. Remit by P. O. money or express order, bank draft or registered letter, addressing all orders to

WM. HENRY MAULE, 1711 FILBERT STREET, PHILADELPHIA, PA.

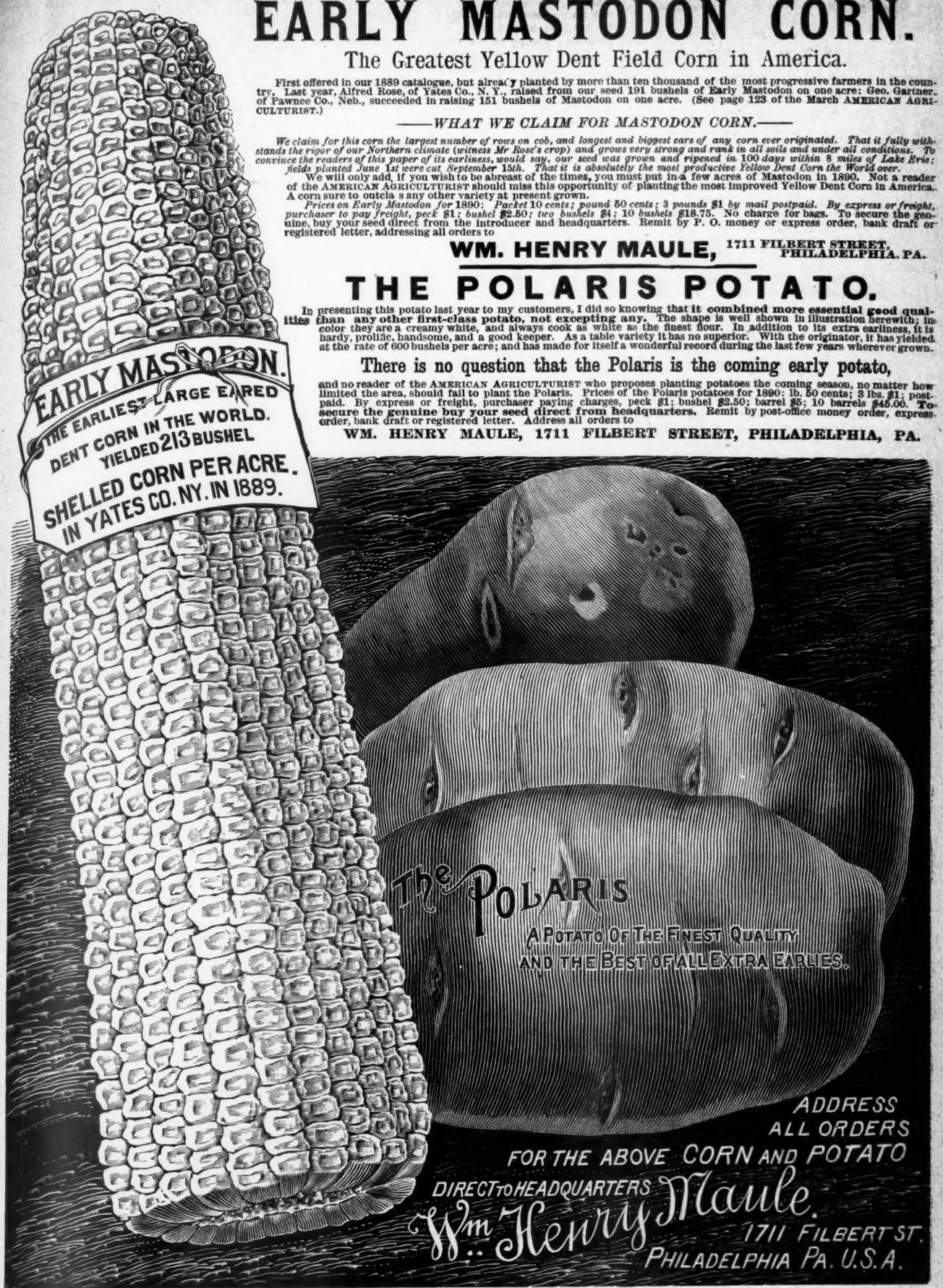
THE POLARIS POTATO.

In presenting this potato last year to my customers, I did so knowing that it **combined more essential good qualities than any other first-class potato, not excepting any.** The shape is well shown in illustration herewith; in color they are a creamy white, and always cook as white as the finest flour. In addition to its extra earliness, it is hardy, prolific, handsome, and a good keeper. As a table variety it has no superior. With the originator, it has yielded at the rate of 600 bushels per acre; and has made for itself a wonderful record during the last few years wherever grown.

There is no question that the Polaris is the coming early potato,

and no reader of the AMERICAN AGRICULTURIST who proposes planting potatoes the coming season, no matter how limited the area, should fail to plant the Polaris. Prices of the Polaris potatoes for 1890: lb. 50 cents; 3 lbs. $1; postpaid. By express or freight, purchaser paying charges, peck $1; bushel $2.50; barrel $5; 10 barrels $45.00. **To secure the genuine buy your seed direct from headquarters.** Remit by post-office money order, express order, bank draft or registered letter. Address all orders to

WM. HENRY MAULE, 1711 FILBERT STREET, PHILADELPHIA, PA.


EARLY MASTODON.
THE EARLIEST LARGE EARED DENT CORN IN THE WORLD.
YIELDED 213 BUSHEL SHELLED CORN PER ACRE.
IN YATES CO. NY. IN 1889.
The POLARIS
A POTATO OF THE FINEST QUALITY AND THE BEST OF ALL EXTRA EARLIES.
ADDRESS ALL ORDERS FOR THE ABOVE CORN AND POTATO DIRECT TO HEADQUARTERS
Wm Henry Maule.
1711 FILBERT ST.
PHILADELPHIA PA. U.S.A.

NEW STRAWBERRY "LADY RUSK"

The best berry for long distance shipments. Will not rot or melt down if packed dry. Headquarters for all leading varieties of Berry Plants and GRAPE VINES having 300 acres in cultivation. Catalogue free.
WM. STAHL, Quincy, Ill.

999,999 FARMERS WANTED from every State and Territory to send for free trial sample of STEWART'S CELEBRATED CLARKE COUNTY CHAMPION WHITE CORN. A very prolific Ninety Day Corn, 125 bu. having been raised on a single acre. Send three two-cent stamps for sample to pay postage, and our Catalogue of Tested Flower, Field and Garden Seeds. THE J. D. STEWART SEED CO., SPRINGFIELD, OHIO

JERRARD'S SEED POTATO CATALOGUE

MY SEED POTATOES are grown from the Choicest Stock, in the virgin lands of the cold North-East. I have the best New and Standard Sorts, and warrant them superior to all others for seed. I raise my SEED CORN 150 miles Farther North than the North line of Vermont, and for Early Crops my CARDEN SEEDS have no equal.

I offer this season my new HARBINGER POTATO, which I believe will be the Great Market Potato of the future. And my new EARLY BRYANT CORN, a handsome yellow variety, the Earliest of All. I have Special Low Freight Rates everywhere. My fine new Catalogue Mailed Free. ☞Name this Paper and address

CEORCE W. P. JERRARD, Caribou, Maine.

GRAPE VINES Largest Stock in America. NIAGARA and all old and new varieties. *Extra Quality.* Warranted true. Lowest rates. Introducers of the *new Black Grape* EATON.

Also other SMALL FRUITS. Descriptive Catalogue Free. Send list for prices. T. S. HUBBARD CO., FREDONIA, N.Y.

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The "PLANET JR." No. 2 GARDEN DRILL is beyond question the best; sows the most difficult seeds; opens, covers, rolls down and marks the next row with the greatest regularity.
The COMBINED DRILL and HOE, &c. The greatest favorite ever produced. Perfection as a Seed Drill, or as a Plow, Hoe, Garden Rake, Cultivator or Marker. Saves labor and seed and soon saves cost.
The DOUBLE WHEEL HOE. A money maker for farmers and gardeners. Works both sides of a row at once. Plows to or from, opens furrows, covers, cultivates, hoes, rakes and has leaf guards.
DOUBLE WHEEL HOE PLAIN. Same as last, but has one pair of hoes only.
The SINGLE WHEEL HOE is a treasure. Beats the double in some crops; is lighter. Has a Large Plow, two Long Hoes, two Rakes, three Cultivator Teeth, and a Leaf Guard.
The FIRE-FLY SINGLE WHEEL HOE. Equals the last, except has no rakes nor leaf guard.
The FIRE-FLY GARDEN PLOW. Worth its price yearly in a garden 20x40 feet.
The GRASS EDGER. The newest, neatest, cheapest and best machine known for edging paths and flower beds.
The 1890 HORSE HOE. The finest tool and most costly to make that we have ever offered. Yet the result justifies our care, as every one who sees the tool will admit. The first grand improvement is our new patent Lever Expander, one all farmers admire and which they will pay $3.00 for, to put on old machines. The next feature is our patent Handle Shifter, enabling one to walk to one side of his work: worth $3.00 a day for some crops. Yet we ask but a small additional price for both these fine features. Why not send for full descriptive catalogue of these and all our other useful improvements. Free to all.

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"Yale" Strawberry.

The coming LATE Strawberry for the table, for canning or for market. For further information send for circular. Address STEPHEN HOYT'S SONS, New Canaan, Ct.

1,000,000 Strawberry Plants,

15 reliable varieties, also large quantities of Sweet Potato and other vegetable plants, at low prices. All well packed. Address
CHAS. BLACK, Hightstown, N. J.

A NEW POTATO. Early Six Weeks Market. Guaranteed 2 weeks earlier than any other. Yields 420 bu. per acre—lb, 50c, 2½ lb, $1, by mail; 30 pkts seeds, $1. 10 Roses, $1; 8 Chrysanthemums, 50c; 10 Concord Grape-Vines, $1. Best Catalogue published, free. Send for it to-day.
J. A. EVERITT & CO., Seedsmen, Indianapolis, Ind.

SPRAYING FRUIT TREES is an absolute necessity. Our Perfection Outfit stirs the liquid automatically, and will spray 100 trees per hour. Cheapest and Best. Also Outfits for Horse Power. Circulars free.
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SPRAY YOUR TREES.

We make the cheapest and best Spraying Pumps in the market. Send for illustrated circular.
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FRUIT AND SHADE TREES, Berry Plants. Grape-Vines, Gladiolus Bulbs, Geraniums, etc. Price list free. S. C. DeCou, Moorestown, Burlington Co., N. J.

SMALL FRUITS! Plants, Vines, &c. Best varieties, both New and Old, at reasonable rates. Address IRVING ALLEN, Springfield, Mass.

BERRY, Black Cap, Ohio, $6 M: also Schaffer's Col., $8. First class selected tips, packed in best manner. R. JOHNSTON, Shortsville, Ont. Co., N. Y.

SEED POTATOES.

Choice selected Houlton. Aroostook County, Maine, Early Rose, Beauty of Hebron and all other well-known varieties. For sale by
W. E. DURYEA'S SONS,
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New Descriptive Catalogue of 125 pages, with many Rare and Desirable Plants.
Sent to all applicants inclosing a stamp.
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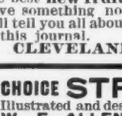
GRAPES PLANTS of Best Quality. Warranted true to name. Lowest Prices, and Largest Assortment of old and new varieties. At dozen rates, free by mail. Special attention called to promising Novelties. *Send for Price list.* Address
BUSH & SON & MEISSNER,
Bushberg, Jefferson Co., Mo.



GRAPE VINES at greatly reduced rates. Also Strawberries, Blackberries, Raspberries, Currants, Wonderful Peach, and other Nursery Stock. *Prices reasonable* Descrip. Catalog, with *instructions for planting and pruning* FREE. JOEL HORNER & SON, Oelair, Camden Co., N. J

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Illustrated and descriptive catalogue free. Send for it.
W. F. ALLEN Jr., ALLEN, MARYLAND.

SEEDS 6 pkts. of my choicest Flower Seeds 10c. Beautiful catalogue free.
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TO THE FLOWER AND VEGETABLE GARDEN. Beautifully Illustrated, and containing a Magnificent Colored Plate. Mailed to any address *Free.* Address
CROSMAN BROS., Rochester, N.Y. *Established 1849*

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WONDERFUL PEACH.
Lawson, Kieffer, LeConte and Idaho. Japan and NATIVE Plums. Apples, Cherries, Peaches and Nut-bearing Trees. Strawberries, Raspberries, Blackberries and Grapes in large supply. All the worthy old and promising new fruits.
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This grape originated in the Green Mountains of Vermont. It is very early; color, greenish white; pulp tender, sweet and delicious. The only grape yet introduced that ranks first, both in earliness and quality. Each vine sold will be sealed with our Trade-Mark.
None genuine without it, as our copyright name "GREEN MOUNTAIN," gives us the exclusive right for its propagation for sale. Send for Circular giving further information. Address
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Address D. F. LEONARD, 149 W. Randolph St., Chicago, Ill.

BECKERT'S GARDEN SEEDS. Send for our 1890 Catalogue! which we mail free to all purchasers of seeds. It contains a complete list of everything that is desirable in Vegetable and Flower seeds, Select Field seeds, Seed Potatoes, Spring Bulbs, Plants, etc., etc.
WM. C. BECKERT,
SEEDSMAN, ALLEGHENY, PA.
☞Mention this paper.

GLOBE WONDERFUL NEW FRUITS. Globe, Ford's Late, White and Wonderful Peach, Jessie, Pineapple and Cloud Strawberries; all kinds of Fruit Trees and best Small Fruits at Fair View Nurseries. Established 1835. Oldest in the State. Catalogue and price list free.
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John Saul's Washington Nurseries.

Our Catalogue of New Rare and Beautiful Plants for 1890 will be ready in February. It contains a list of all the most beautiful and rare greenhouse and hot-house plants in cultivation, as well as all novelties of merit, well grown, and at very low prices. Every plant-lover should have a copy.
Orchids.—A very large stock of choice East Indian, South American, etc. Also Catalogues of Roses, Orchids, Seeds, Trees, etc., all free to applicants.
JOHN SAUL, Washington, D. C.

BERRY GROWERS.

Improved Folding Paper Berry Basket for shipping and delivering. Heavier Paper. Square Bail and Cover. Send $2 for 500 baskets or two-cent stamp for sample.
Detroit Paper Novelty Co.
Detroit, Mich.

TREES ROCHESTER COMMERCIAL NURSERIES. Address W. S. LITTLE, Rochester, N.Y.
NEW and RARE, OLD and RELIABLE. Both Fruit and Ornamental. ROSES, Vines, Clematis, Rhododendrons, etc. Two illustrated catalogues 6c. Free to customers. ☞ Wholesale List, FREE.

STRAWBERRY HULLER. By mail, 10 cents each; 3 for 25 cents.
A. S. BUNKER, Lawrence, Mass.

SEEDS, BERRY PLANTS, VINES, TREES. Send list of wants for special prices. List free.
ALLYN BROS' NURSERIES, Palmyra, N. Y.

Experience with Tomatoes.

At a recent meeting of the New York Farmers' Club, the subject for consideration was tomato culture. In the course of the discussion a great deal of interesting and valuable information was elicited. Mr. N. Hallock, of Long Island, read a brief paper on the subject. He stated that the first tomatoes cultivated for food in this country were raised by an old gardener for Robert Lenox, near 71st street, New York, on ground which now forms a part of Central Park. Afterward, an old Long Island farmer glutted the New York market with six baskets, most of which he was obliged to throw into the street for lack of buyers. Now they are cultivated by hundreds of acres for the New York market alone. The consumption is universal. Not a ship leaves port without having among its stores a full quota of canned tomatoes, and it has been well said that the emigrant trails across the Western plains are marked by continuous rows of empty tomato cans. The great change in use has been accompanied and, in a large degree, caused by the changes in the fruit itself. Originally it was deeply wrinkled, seedy, and unpleasantly sharp-flavored. With the continual improvements of many years the tomato of to-day is smooth in form, solid in texture and mildly sub-acid in flavor.

In narrating his experience Mr. Hallock stated that he had found that a light sandy soil, with little or no manure, produced the earliest but lightest crops.

The Acme and other purple varieties, which had all been propagated from the old Feejee Island tomato, were most affected with the fungous disease, and the first to rot from its effects. Not one of that type stood six days of the warm, rainy weather of last summer. He detailed the results of trials with some fifteen or twenty varieties. The list included such as he would recommend, in the following order:

First Early Red.—Ignotum, Hosford's Prelude, Station.

Second Early Red.—Volunteer, Thorburn's New Jersey, Livingston's Favorite, Matchless, Lorillard, Finch's Essex Hybrid. In gardens where the rot had not appeared he would add Acme, Mikado, and Climax.

Yellow.—Golden Trophy, Golden Queen.

The Station is a French variety formed by crossing the French tree tomato with Alpha. It ripened with him in 111 days from the time of sowing the seed. It is very good, and a free bearer. The Volunteer ripened in 125 days, and the fruit kept nineteen days. Solid fruit and good quality. Thorburn's New Jersey ripened in 126 days and kept six days. Fine, large fruit of good quality. Kept well in the rain. Livingston's Favorite ripened in 130 days, and kept eight days. Fruit red, with good flavor, but cracked at the stem. Matchless ripened in 129 days; kept nineteen days. Large crop of good fruit. Finch's Essex Hybrid, an improvement on the original Essex Hybrid, kept nineteen days. Purple Climax ripened in 125 days; kept six days. Acme ripened in 126 days; lasted five days. Good, large fruit, somewhat wrinkled. Ivory Ball and White Apple are small, white varieties, almost rot-proof.

When it came to name the best of all varieties, so far as his experience went, Mr. Hallock said he was reluctant to tell all that he believed, lest he should be suspected of wishing to "boom" a new sort. But the Ignotum had so far surpassed all others with him that he did not hesitate to regard it as the best he had ever tried. It originated with Prof. Bailey, while he was connected with the Agricultural College of Michigan. The fruit is smooth, lively scarlet in color, solid and meaty in texture, and of fine flavor. It ripened in 116 days from the time of sowing the seed, and the fruit kept in perfect condition eighteen days after being picked. After the first picking it continued to ripen until October 12, when killing frosts came, and the plants were then loaded with green fruit. He regarded it as the best variety he had ever known, for the market, the cannery, or the table.

Invaluable to all Classes.—The AMERICAN AGRICULTURIST is worth the subscription price asked without any premiums whatever. The information in a single number is worth to the farm and stock-raiser more than the subscription price for a year, and then the general information which it contains makes it almost invaluable to all classes. J. N. BEAL, Edwards Co., Kans.

The Best Farm Journal.—I thank you for all your unwearied efforts in producing the best farm journal. ALVA M. RICHARDSON, Middlesex Co., Mass.

1890. DO YOU MAKE HAY? 1890.

Keep up to the times; the latest and best improvements are not too good for the farmer.

LABOR SAVING, TIME SAVING AND MONEY SAVING MACHINES

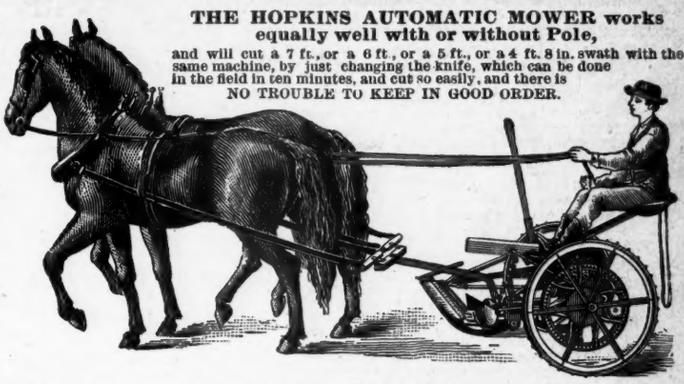
Must come to the front.

The Automatic Mower and Mfg. Co.

THE HOPKINS AUTOMATIC MOWER works equally well with or without Pole,

and will cut a 7 ft., or a 6 ft., or a 5 ft., or a 4 ft. 8 in. swath with the same machine, by just changing the knife, which can be done in the field in ten minutes, and cut so easily, and there is

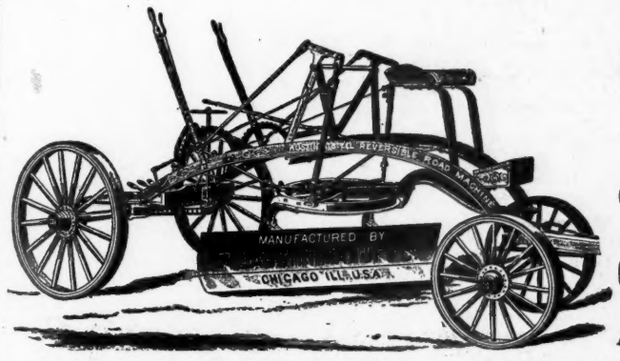
NO TROUBLE TO KEEP IN GOOD ORDER.



Are prepared to furnish the Hopkins Automatic Mower, 4¼, 5, 6, and 7 ft. cutting apparatus. This mower is automatic, that is, self-adjusting; *can be used with or without a pole*, except in turning square corners and backing. *No weight on horse's neck.* Adjusts itself to uneven ground and cuts close. It is the most durable machine in the market, and we guarantee it to cost less for repairs than any other machine. The Automatic Pitman and knife connection is a new invention of 1890—1890—1890—and is the best ever seen by any farmer or mechanic. It is put on without screw, or bolt or nut; you can take it off and put it on as easily as you can put on or take off a pair of mittens, and the connection is so made that it takes up the wear automatically; therefore there is no lost motion, no hot box, *no wear out*, and no trouble. A boy eight years old can run the machine and take care of it all except grinding the knives. We pay the freight and sell to farmers, and it is a farmer that manufactures and sells them. T. W. Harvey, breeder of Shorthorn and Angus cattle, English Shire and French Coach and Hackney horses and Southdown sheep, at Turlington, Neb., makes this mower at the new town of Harvey, Cook Co., Ill., two miles from Chicago, on the Illinois Central and Grand Trunk R. R. Mr. Harvey has organized the company as above and manufactures the Hopkins' Automatic Mower. Write for circulars. Read the testimonials. Fewer parts than any machine in the market. Gear independent of pole and driver's seat, therefore no vibration felt by driver or team. Send orders direct to the

AUTOMATIC MOWER & MFG. CO., 823 Rookery B'ld'g, Chicago, Ill.

The Austin Steel Reversible Road Machine.



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Carpenter Street and Carroll Ave.,

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Send for catalogues.

Agents wanted.

Frame built entirely of steel, practically indestructible. Sarven wheels with broad tires, light direct draft, easy of adjustment, does its own plowing, and will do a larger variety of road and ditch work than any other machine of its class, and with a saving of 75 per cent over Plows and Scrapers. **Exclusive agencies to active men in all unoccupied territory. Now is the time to apply.**

COE RIDGE, Ohio, Nov. 17th, 1889.

WILBER H. MURRAY MANUFACTURING CO., CINCINNATI, O.

DEAR SIRS:—Your No. 4 "Murray" harness arrived O. K. on the 22d. I am more than pleased. It far exceeds my expectations, being as good, or better, in material and finish as the ones I examined in Cleveland, O., for $26. The neighbors that have seen it wonder how you can supply as good an article for the money. If I can secure you a few orders this winter, I shall be only too happy to do so. Yours, Very Respectfully,

ED. COLLINS.

Farmer's Favorite GRAIN DRILLS.

The greatest variety, and in popular styles; unequaled in leading features. Send for circular. Mention this paper.

Bickford & Huffman, Macedon, N. Y.

FREE TO ALL.

Send your address immediately, on postal card, for our 80-page elegantly Illustrated Catalogue, describing more than 300 of our Works pertaining to Rural Life.

ORANGE JUDD CO., 751 Broadway, N. Y.

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For Every Fireside. By CHARLES F. DEEMS, D.D. A New and Popular work. WISE, WELCOME, WITTY. Eight exquisite Pictures in Oil, equal to any Prang Chromo; Steel Portrait of the Author; MS. Fac-similes of Famous Poems. 640 pages magnificently printed and bound. 10,000 Agents Wanted. ELEGANT OUTFIT. Send for circulars to HUNT & EATON, Fifth Avenue and 20th Street, N. Y.

THE DAIRYMEN'S SUPPLY CO. G. R. MELONEY, Mgr., 1906 Market St., Philadelphia.

BUTTER FACTORY MAKERS' SHIPPERS' CHEESE MAKERS' **SUPPLIES**

WRITE US WHAT YOU WANT.

EMPLOYMENT! FREE $3.25 Sample. Agents wanted. New Goods. Sole Agency given. BIG PAY. Address with stamp W. E. BEVERIDGE, BALTO, MD.

MATTERS OF BUSINESS.

An Interesting Origin.—Thatcher's Orange Butter Color was originated and perfected in the study of colors in grasses and traced to cream and butter with one of Beck's fine London microscopes.

Cheap and Reliable.—The Miami Buggy Co., Cincinnati, which advertises its buggies and harnesses at such low prices, is reliable and trustworthy. We are assured that its warranty of any article sold by it may be depended on.

Clearing off Land.—For pulling out round stumps and lifting half-sunken bowlders, Bennett's Stump-Puller and Rock-Extractor is a very effective appliance. It is cheap, powerful, and can be operated by one man. Send to H. L. Bennett, Westerville, Ohio, for free circular.

Arbor Days in New Mexico.—The useful and beautiful custom of setting apart a day for tree-planting is becoming national in extent. This year New Mexico is observing two Arbor Days. March first was the day for the southern and April first is for the northern part of the territory.

A Large Farmer in Lucas Co., Ohio, says:—"I have used one of the Acme Pulverizing Harrows for a number of years, and like it very much. For sod it cannot be beat—for covering small grain it does fine work. The fact is it cannot be beat by any other harrow I have ever seen, in any kind of soil."

Standard Scales.—In these times of low prices, farmers cannot afford to do business by guess, especially when accurate and durable scales are sold as cheaply as they are by Osgood & Thompson, Binghamton, N. Y. The illustrated price-list and full descriptive catalogue is sent free on application.

Vegetable and Greenhouse Plants.—Mr. Charles Black, of Hightstown, New Jersey, having given up the nursery business, is engaged in growing vegetable and ornamental plants. He supplies, in their respective seasons, sweet potatoes, tomatoes, cabbage, celery, etc., as well as a great variety of flowering plants.

A Map of the United States.—A large, handsome Map of the United States, showing North and South Dakota, mounted, and suitable for office or home use, and issued by the Burlington Route, will be furnished responsible parties, free, on application to the undersigned, P. S. Eustis, Gen'l Pass. and Ticket Agent C., B. & Q. R. R., Chicago, Ill.

Plows and Cultivators.—The Syracuse Chilled Plow Company, of Syracuse, N. Y., is in the field with a great variety of steel and chilled iron hand and sulky plows, with steel, iron, or wood beams. The company also makes a steel-frame cultivator, fitted up for a great variety of work, and a new spring-tooth harrow, of improved construction.

Seed for Prize Crops.—The big oat-crop of over 134 bushels on one acre, which took the prize of $500, was raised from seed of White Bonanza oats bought of John A. Salzer, La Crosse, Wisconsin. There are plenty more of them for sale at the same place, besides a large stock of seed potatoes, embracing the most successful varieties.

A Chautauqua Nursery.—Mr. Geo. S. Josselyn, whose advertisement will be found in our paper, is first-class in reputation, and does an immense business in grapevines and small-fruit plants. He was the introducer of the famous Fay's Prolific Currant, and later, of new Seedling Grapes Esther and Rockwood, from the originator of the Concord grape.

Economy in Food for Stock.—Farmers who desire to cook the food for their stock will do well to send to the Rice & Whitacre Manufacturing Co., Chicago, for a catalogue of their Triumph steam generators, engines, boilers, and other useful implements. The Triumph saves a large per cent of the food, and is safe, easily managed, and inexpensive.

Dairy Novelties.—The important matter of correct acidity at which to churn the cream is solved by Boyd's Automatic Fermenting Can. It operates in connection with the Automatic Ripening Cream Vat. The combined action is to produce perfect uniformity in the temperature and acidity of the cream in any weather. They are made and sold by Cornish, Curtis & Greene, Fort Atkinson, Wisconsin.

Horticultural Statistics.—Orchard products, nurseries, seed, and flower farms, etc., will receive more consideration in the census of 1890 than was accorded to these important industries ten years ago. General horticulture will be under the charge of Mr. Mortimer Whithead, of New Jersey, and Mr. J. H. Hale, of Connecticut, will be special agent for nursery and related statistics. We are pleased to note these appointments, as both gentlemen are excellently fitted for the work.

American Veterinary College.—At the fifteenth annual commencement of the American Veterinary College at New York, thirty-six gentlemen of the graduating class received at the hands of President Liantard diplomas conferring the degree of Doctor of Veterinary Surgery. The college was never more flourishing or useful than at present. A communication was read from the French Minister of Agriculture stating that French veterinary colleges would recognize degrees conferred by this institution.

Dress Silks.—We wish to call the attention of our readers to the advertisement of Chas. A. Stevens & Bros., Chicago, which appears in this issue. This firm is perhaps familiar to most of our readers, as they are so frequently quoted by the leading fashion magazines as high authority on dress silks. Their little catalogue is the most complete silk catalogue in the world, and every reader should improve this opportunity to get one by simply sending them their address on a postal card, for it is a book of great interest to every lady. See their advertisement on back of cover.

Book-Keeping Simplified.—Mark C. Farr, of 95 Clark street, Chicago, manufactures and sells a blank-book, with printed headings, which is a great labor-saver. It is called a "Merchandise Memorandum," and is so arranged that each line contains a complete view of every invoice or bill entered. It shows at a glance the date, rate of discount, and all other particulars. Mr. Farr has also bought out the business formerly carried on by J. F. Swab, manufacturer of dairy machinery, Cedar Rapids, Iowa, and has carried it to Chicago. He sells every requisite for the creamery and dairy, as well as the useful book referred to above.

The Hopkins Mowing Machine.—Mr. Turlington W. Harvey, whose Aberdeen-Angus herd at Turlington, Nebraska, is famous, has made a new departure in the direction of mowing-machines. Becoming convinced of the great merits of the Hopkins automatic machine, he has bought the works and organized a company, in which he retains a controlling interest, for the improvement, manufacture, and sale of the implement. The works are at the new town of Harvey, near Chicago, where Mr. Harvey has purchased seven hundred acres of land, and is now building shops. His name alone is sufficient to inspire confidence in the machine and the thorough honesty of its construction.

Life Subscriptions.—A large number of our subscribers are permanent readers of the AMERICAN AGRICULTURIST. That is, they take it year after year, and mean to do so as long as they live. To such the payment of the annual subscription is a bother of which they would be gladly relieved. We have, therefore, arranged for life subscriptions to the AMERICAN AGRICULTURIST. Any person paying Twenty Dollars at one time will have the magazine sent to his or her address for twenty years, postage prepaid, and it will be continued, free of all expense, for as much longer as the subscriber may live. A certificate to this effect will be given to each life subscriber, the list of which will constitute a sort of roll of honor.

Speed and Luxury.—The marvels of swift and luxurious travel are the superbly appointed fast express trains over the New York Central & Hudson River Railroad. First in each day is the new fast mail and express which leaves the Grand Central station, New York, at 8.50 A. M. for Buffalo via Auburn and Canandaigua. An hour later the famous New York & Chicago limited leaves the station. This train has an elegant buffet, smoking and library car with barber-shop and bath-room, luxurious private compartment sleeping-cars, straight 16-section sleeper, dining- and drawing-room car. At 10.50 A. M. the Southwestern limited departs for Cincinnati, Indianapolis, and St. Louis. The train has the same luxurious equipments as the other two. The fast Western express leaves the Grand Central station at 6 P. M. with sleeping- and dining-cars. All these trains are vestibuled.

The Champion.—The Warder, Bushnell & Glessner Company, of Springfield, Ohio, has recently acquired all the interests of all other parties in the patents of the Champion binders, mowers, and reapers, and now owns the exclusive right to make and sell them everywhere. The Champion machines have attained a commanding popularity among farmers. The company, with a capital of three million dollars, and a plant covering more than forty acres, is now prepared to meet all demands. The Champion binders, mowers, and reapers have been long on the market, and their reputation is thoroughly established. They are recognized as the standard for excellence in all that goes to make a first-class self-binding harvester, mower, or reaper. Doubtless many of our subscribers now own or have used Champion machines. Their manufacture at Springfield, Ohio, by the Warder, Bushnell & Glessner Company, forms the chief industry of that city.

The Triumph of Steel in Harvester-Building.—When, in 1886, a Harvesting Machine made practically of steel instead of wood, was introduced, it was denounced by all harvester manufacturers, except the manufacturers introducing it—William Deering & Co.—because, *as they said*, it was not as durable as the wooden machines; but in reality their denunciation was caused by the fact that they feared that it would overturn their old methods of manufacture and give the farmers machines so durable in structure as to prevent their frequent reappearance to purchase another machine. Wm. Deering & Co., however, persisted in giving the farmers the benefit of their inventive ability, and in four harvest seasons they have *forced* every other manufacturer worth calling such to build an imitation steel machine. For 1890 the farming public will see their greatest achievement—the New Junior Steel Binder.

A Great Company.—Four hundred and ninety-five million dollars of insurance in force—an increase of over seventy-five millions in 1889! Thus runs the report of the New-York Life Insurance Company for the year just ended. There are not so many greenbacks in the country as that, by about one hundred and fifty millions. The number of persons insured is about one hundred and fifty thousand. The New-York Life is one of the old and purely mutual companies, organized away back in the forties, and has had a steady growth for nearly half a century. It is not only one of the largest in the country, but one of the strongest and best, having been the pioneer in some of the most notable reforms in the life insurance system. It was the first company to omit the suicide clause from its policies; the first to issue non-forfeiture policies; and its various forms of contract now offered meet the requirements of all conditions and purses.

Bone-Meal vs. Superphosphate.—Guy O. Kelton, Rutland Co., Vt., asks us if bone-meal will have the same effect as superphosphate. When superphosphate was first used, about forty-eight years ago, it was made from ground bones. Bone-dust had been used previously with good effect. But when the present method of making the phosphate of the bones soluble, changing it into a superphosphate, farmers found such remarkable effects from its use that the new manure soon took the place of the old. It was used to such a large extent that the supply of bones could not meet the demand. Then coprolites, or mineral phosphates, were discovered, and superphosphate was made from them. Superphosphate made from a given amount of phosphate of lime in coprolites, or "Charleston rock," is just as good as superphosphate made from the same amount of phosphate of lime in burnt bones. The phosphate of lime in bones becomes only slowly soluble in the soil. When converted into superphosphate it is soluble, and can be taken up by the plants at once. Hence, a small amount of superphosphate will have a far greater effect the first season than the same amount of phosphate of lime in bones. Bone-meal, however, contains nitrogen, which mineral phosphates do not. But it is an easy matter to add some substance containing nitrogen to the superphosphate. And, in fact, nearly all the manufacturers of commercial superphosphate add sufficient nitrogen to make it equal to "dissolved bones." Whether it is best to buy superphosphate or bone-meal depends largely on what crops you intend to use it on, as well as the relative price. Bone-meal can sometimes be purchased at a price that gives better and more lasting effects for a given amount of money than superphosphate.

Kind Words.

For Twenty-One Years.—The AMERICAN AGRICULTURIST has found a hearty welcome to my home for the past twenty-one years.

REV. J. C. WATERS, Ulster Co., N. Y.

It Only Requires to be Seen to Win Subscribers.—The AMERICAN AGRICULTURIST is highly prized with us. It only requires to be seen to win subscribers.

J. H. AUK, Kingston, Jamaica, W. I.

Shall Stick to it.—The AMERICAN AGRICULTURIST is the best farm paper I have ever seen, and I shall stick to it as long as I am able to read it.

W. ANDREWS, Northampton Co., Pa.

Lost Without it.—I have been a continuous reader of the AMERICAN AGRICULTURIST since 1856, and expect to be as long as I live. I should feel lost without it.

J. Y. ALLISON, Jefferson Co., Ind.

The Best.—I am well pleased with the AMERICAN AGRICULTURIST, and think it is the best magazine of its kind. It is so full of useful hints of great value to the whole family. J. L. MARTIN, Monmouth Co., N. J.

The Best for the Price.—As long as I live on a farm, I shall take the AMERICAN AGRICULTURIST. It is the best farm paper for the price that is published, and should be in every farmer's house.

C. W. DICKINSON, McKean Co., Pa.

No Hobbies.—I am glad to find a paper which has no hobbies, and which can substantiate everything it says. It is as good a birthday gift as a person need want, and is welcomed by all who ever perused its pages.

MARCUS C. GOWMAN, Essex Co., Ontario.

A Model Publication.—We know of no agricultural publication that interests so wide a circle of readers; that is so valuable for its practical suggestions, or that is so finely illustrated as the AMERICAN AGRICULTURIST. It is indeed a model publication, and the low price at which it is offered, combined with its many attractions, have given it an immense circulation.

THE CLAREMONT, N. H., ADVOCATE.

Drop a Postal.

It is yours for the asking.

Return mail will bring it to you entirely free of charge.

A book of 200 pages, containing the names and addresses of men and women cured of desperate diseases by the use of Drs. Starkey and Palen's Compound Oxygen Treatment.

* * * * * *

It's good reading for the sick man.

Just the news he wants to hear.

Records of cures: Hearty indorsements from such well known men and women as the celebrated advocate of the temperance cause, Mrs. Mary A. Livermore; the late T. S. Arthur; Wm. Penn Nixon, editor of Chicago Inter-Ocean; Ex-Senator C. S. Powers; Dr. O. A Darey, president of the Columbia (S. C.) Female College; Rev. A. A. Johnson, president of Wesleyan College; Rev. J. F. Spence, president of Grant Memorial University, Athens, Tenn.; Warren A. Chandler, D. D., president of Emory College; J. D. Logan, D. D., president of Central University; Bishop Benade, Bishop Castle, and many others equally well known.

* * * * * *

Drs. Starkey and Palen's Compound Oxygen Treatment has cured thousands.

Their record books show over 55,000 cases in which their treatment has been used.

More than 1000 physicians use it in their practice now.

It is very simple.

Blood food, nerve nourishment.

A deep inhalation takes it directly to the breathing surfaces.

At once the blood absorbs it; circulation is quickened; there is something to circulate.

The system responds, your strength comes back, and a man with his natural strength is either well or soon will be.

Strength to resist disease.

That's the point. That's the good of the Compound Oxygen Treatment.

* * * * * *

You may know that the Compound Oxygen Treatment is valuable for another reason.

What has followed success in any case that seems to be the result of a simple process?

Take any instance you please:

Have not scores of men and women tried to follow the example of the original?

Have they not taken advantage of the brains that pioneered through the obstacles?

Well, that's precisely what happened to Drs. Starkey and Palen.

When they first introduced their Compound Oxygen Treatment into general use, there was no other such remedial agent known.

They gave it well nigh universal vogue.

That was the chance for imitators.

They did not neglect it.

* * * * * *

Drs. Starkey and Palen's Compound Oxygen Treatment has been in use for over 20 years.

A staff of six skillful physicians constantly in attendance.

They examine patients personally or they answer the inquiries made through the mail.

A lady physician especially skilled in the treatment of all female disorders is a valuable addition to the staff.

Send for the book and find out all about it.

You will get it free of charge if you will address

DRS. STARKEY & PALEN,

No. 1529 Arch St., Philadelphia, Pa.; 120 Sutter St., San Francisco, Cal.; 58 Church St., Toronto, Canada.

Below is a half page taken from the book.

The indorsement of an upright man, a vigorous thinker, a prolific author, the late T. S. Arthur.

''January 1, 1883.

''Previous to the year 1870 my health had been very poor. I was forced to abandon all earnest literary work, and I regarded my career in authorship at an end.

''About this time my attention was attracted to Compound Oxygen. I tried the Oxygen Treatment as an experiment. That it would do for me what it has I had not dared hope.

''Its effect was not that of a stimulant, but of an almost imperceptible vitalizer of the whole system. Soon I began to have a sense of such physical comfort as I had not known for years. My strength was gradually returning. This slowly but steadily increased. For more than seven years after this I applied myself closely to literary work, doing, as I believe, the best work of my life.

''Nor was it only in the strength and vitality that I gained by the use of Compound Oxygen. For twenty years I had suffered with frequent paroxysms of nervous headache. They were very severe, lasting usually six or seven hours. In a year after I commenced the Compound Oxygen Treatment these were almost entirely gone. It is now over ten years since I had such an attack of nervous headache.

''T. S. ARTHUR.''

No less famous in the same field of effort—the cause of temperance and reform—is Mrs. Mary A. Livermore.

Observe what she has to say.

''Melrose, Mass., February 1, 1884.

''DRS. STARKEY & PALEN:

''Four years ago this spring, at the end of a very severe and exhausting winter's work, I found myself utterly broken down in health. My superb constitution had hitherto carried me triumphantly through every task I had imposed upon myself, and had been equal to every phase of protracted labor that had fallen to my lot. But I was now completely prostrated, with no power of recuperation. My mental depression was as severe as my physical prostration. I believe the hopeless invalidism which I had most dreaded had come to me, and my chief aim was to hide myself from the friends and acquaintances who were afflicted on my account.

''My husband ordered a Home Treatment; I used it for a month before I began to rally. Then my return to good health was rapid, and since then I have enjoyed almost uninterrupted perfect health and almost youthful vigor. I resumed work immediately.

''Yours truly, MARY A. LIVERMORE.''

Catalogues Received.

FROM SEEDSMEN, NURSERYMEN, ETC.

C. E. ALLEN, Brattleboro, Vermont: Seed and plant guide for 1890.

ALLYN BROTHERS, Palmyra, Wayne Co., N. Y.: Annual catalogue of small-fruit plants, trees, vines, shrubs, field, garden, and flower seeds.

ALNEER BROTHERS, Rockford, Ill.: Illustrated catalogue of everything for the flower and vegetable garden.

BUSH & SON & MEISSNER, Bushberg, Missouri: Semi-annual price-list of American grapevines.

FRED. P. BURR & CO., Middletown, Conn.: Price-list of garden and flower seeds. A novel feature is the offer of premiums for earliest and best crops. One of the premiums offered is a year's subscription to the AMERICAN AGRICULTURIST.

P. J. BERCKMANS, Augusta, Ga.: Catalogue of greenhouse, bedding, and new plants at Fruitland Nurseries. Besides descriptive and illustrated lists of plants, there are concise cultural directions of great value.

PAUL BUTZ & SON, Newcastle, Pa: Wholesale trade-list of florists' stock for the spring of 1890.

W. ATLEE BURPEE & CO., Philadelphia: Burpee's Farm Annual for 1890. Catalogue of Seeds, Swine, Sheep, Poultry, and Collie Dogs.

JOHN LEWIS CHILDS, Floral Park, Long Island, N. Y.: Illustrated catalogue of new, rare, and beautiful flowers. New rosebud popples and Manettia vines are specialties.

CLEVELAND NURSERY COMPANY, Lakewood, Ohio: Illustrated catalogue of grapes and small fruits.

M. CRAWFORD, Cuyahoga Falls, Ohio: Spring catalogue of strawberry plants.

JOHN S. COLLINS, Moorestown, New Jersey: Wholesale price-list of Pleasant Valley Nurseries.

ELLWANGER & BARRY, Rochester, N. Y.: General catalogue of Mount Hope Nurseries. This is a jubilee catalogue, the present being the fiftieth year since the establishment of these renowned nurseries.

WILLIAM EVANS, Montreal: Illustrated catalogue of seeds.

JOHN GARDINER & CO., Philadelphia, Pa.: Illustrated catalogue of garden, field, and flower seeds, and plants.

HIGGANUM MANUFACTURING CORPORATION (successors to R. H. Allen & Co.), New York: Spring catalogue of seeds and agricultural implements. The illustrated list of implements is particularly large and interesting.

T. S. HUBBARD CO., Fredonia, N. Y.: Descriptive catalogue of grapevines and small fruits.

V. H. HALLOCK & SON, Queens, N. Y.: Catalogue of Hallock's famous Long Island seeds for the farm and garden. Also, rare and beautiful flowering plants.

R. D. HAWLEY & CO., Hartford, Conn.: Catalogue of seeds and implements.

DAVID HILL, Dundee, Ill.: Wholesale catalogue of evergreens and forest trees.

JOEL HORNER & SON, Delair, New Jersey: Descriptive catalogue of grapes and small fruits.

THE WILLIAM H. MOON CO., Morrisville, Pa.: Descriptive illustrated catalogue of fruit and ornamental trees, shrubs, small fruits, etc.

H. MYER (late Woolson & Co.), Passaic, New Jersey: Catalogue of hardy perennial plants, bulbs, ferns, and climbers. This is the most complete list of these classes of plants that has come to our notice, comprising almost every species hardy in the Middle and Northern States. The pamphlet is especially remarkable for its correctness of botanical names and accuracy of descriptions.

DELANO MOORE, Presque Isle, Maine: Garden and field seeds, and seed potatoes grown in the extreme north-east corner of the United States.

OAKLAND NURSERY CO., Forgy, Ohio: Wholesale list of surplus stock.

WILLIAM PARRY, Parry, New Jersey: Catalogue of fruit and ornamental trees, plants, small fruits, grapes, etc. This is the fifty-second year of the Pomona Nurseries.

C. H. PERKINS, Moorestown, N. J.: Catalogue for 1890 of Fairview Nurseries.

PLANT SEED CO., St. Louis, Mo.: Vegetable, farm, and flower seeds.

ROBERT C. REEVES CO., 181 Water street, New York: Descriptive catalogue of seeds, fertilizers, and implements.

W. W. RAWSON & CO., 34 South Market street, Boston: Illustrated hand-book of vegetable, farm and flower seeds.

E. W. REID, Bridgeport, Ohio: Catalogue of small fruits, apple, pear, peach, quince, deciduous trees, seeds, etc.

VILMORIN-ANDRIEUX & CO., Paris, France: General catalogue of seeds.

LIVE STOCK AND POULTRY.

W. ATLEE BURPEE & CO., Philadelphia, Pa.: Burpee's manual of thoroughbred livestock and fancy poultry.

JOSEPH BORLER, JR., Carlisle, Pa.: Annual illustrated catalogue and price-list of poultry.

HENRY C. JEWETT & CO., East Aurora, N. Y.: Standard-bred trotting horses at the Jewett Stock farm, the home of Jerome Eddy 2:16½.

C. E. MORRISON, Londonderry, Pa.: Descriptive list of the Excelsior herd of Chester White Swine.

SMITHS, POWELL & LAMB, Syracuse, N. Y.: Catalogue of the Lakeside Herd of Holstein-Friesians. This is more than a descriptive catalogue of this famous herd. It contains, besides extended pedigrees, condensed summaries of the milk and butter records of the herd and of the different families of which it is composed.

MISCELLANEOUS.

APPLETON MANUFACTURING CO., Appleton, Wisconsin: Illustrated catalogue of implements.

BRADLEY & COMPANY, Syracuse, N. Y.: Illustrated catalogue of two- and four-wheeled vehicles.

HOW CHEMICAL MANURES ARE MADE: An illustrated lecture delivered before the Vermont Dairymen's Association and the Rhode Island State Board of Agriculture, by W. H. Bowker, president of the Bowker Fertilizer Co., Boston.

DAISY IMPLEMENT COMPANY, Pleasant Lake, Indiana: Daisy garden implements.

C. H. DEMPWOLF & CO., York, Pa.: Catalogue of fertilizers.

KANSAS CITY HAY-PRESS CO., Kansas City, Mo.: Circular of Lightning Hay-Press.

LOUDEN MACHINERY CO., Fairfield, Iowa: Illustrated catalogue of Louden hay tools. Fruits of twenty-four years in the hay field. Everything for securing the hay crop, from the windrow to the stack or mow.

MORTON MANUFACTURING CO., Romeo, Mich.: Illustrated catalogue of horse-powers and implements.

NO. 1 PERUVIAN GUANO for home-mixed fertilizers: An 8-pp. pamphlet from the Manes Formula and Peruvian Guano Co., 158 Front street, N. Y. "We claim that the formulas for home-mixed fertilizers herein presented are unequaled for cheapness, practical simplicity, choice and varied forms of plant-food, and high concentration, by any ever offered in this country. They effect a large saving in cost over ordinary fertilizers."

THOMAS PEPPLER, Hightstown, N. J.: Illustrated and descriptive circular of farm implements.

L. PRANG & CO., Boston, Mass: A selection of their Easter cards, which form the most appropriate tokens for that festival. They surpass, if that is possible, all their previous efforts.

THE WARDER, BUSHNELL & GLESSNER CO., Springfield, Ohio: Catalogue of Champion harvesting machinery.

Spring Medicine

is a necessity with nearly everybody. The run-down, tired condition at this season is due to impurities in the blood which have accumulated during the winter, and which must be expelled if you wish to feel well. Hood's Sarsaparilla thoroughly purifies and vitalizes the blood, creates a good appetite, cures biliousness and headache, gives healthy action to the kidneys and liver, and imparts to the whole body a feeling of health and strength. Try it this spring.

"I take Hood's Sarsaparilla every year as a spring tonic, with most satisfactory results." C. PARMELEE, 349 Bridge street, Brooklyn, N. Y.

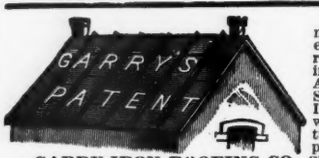
"Hood's Sarsaparilla purified my blood, gave me strength, and overcame the headache and dizziness, so that I am able to work again. I recommend Hood's Sarsaparilla to others whose blood is thin or impure, and who feel worn-out or run down." LUTHER NASON, Lowell, Mass.

N. B. If you decide to take Hood's Sarsaparilla do not be induced to buy any other.

Hood's Sarsaparilla

Sold by all druggists. $1; six for $5. Prepared only by C. I. HOOD & CO., Apothecaries, Lowell, Mass.

100 Doses One Dollar.



We will furnish the most economical roofing and siding, all styles. Also Metallic Shingles from Iron or Steel with full directions and low prices.

GARRY IRON ROOFING CO., Cleveland, O.
Mention Agriculturist.

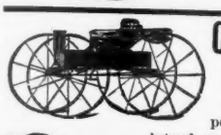
$ DOLLARS $

SAVED to every body who buys Carts, Road Wagons and Buckboards direct from us. Send for CATALOGUE and Rock BOTTOM PRICES.

L. C. LULL & CO., Kalamazoo, Mich.

RUMSEY Skeleton and Body Carts.

PEERLESS ROAD WAGON.
One quality, The Best.
Made only by the
RUMSEY MFG. CO.,
Detroit, Mich., U. S. A.
Send for catalogue.



Carts AND Carriages of every description.

A special bargain for one person at each post-office, to introduce our work. Send 6c for information.

UNION MACHINE CO.,
Carriage Dept., No. 40, Philadelphia, Pa.

CARRIAGES!!

Send for Catalogue. H. H. BABCOCK COMPANY, Watertown, N. Y. New York Salesrooms 406-412 Broome Street.

$49.75 ONE BUGGY at Wholesale Prices

Every Vehicle warranted as represented or money refunded. A good, substantial TOP Buggy well trimmed and painted, $49.75, and other finer grades correspondingly low.

$5.80 for a Good, Single BREAST COLLAR HARNESS. Write for particulars. We are manufacturers' agents for soliciting trade direct with consumers. Address MIAMI BUGGY CO., 209 and 211 W. 5th St., Cincinnati, O.

$5 TO $8 A DAY. SAMPLES WORTH $2.15 Free. Lines not under horses' feet. Write Brewster Safety Rein Holder Co., Holly, Mich.

CARTS, BUGGIES & HARNESS at ½ PRICE

Order direct from the factory and save the profits of Middlemen. Why pay $90.00 for a Buggy when you can buy of us a BETTER BUGGY, INCLUDING HARNESS, FOR $50.00.

For Cash to INTRODUCE OUR WORK. Address with stamp, U.S. BUGGY & CART CO. CINCINNATI, O.

DEERING JUNIOR STEEL BINDER.

KING OF THE HARVEST FIELD.

Works Perfectly on Rough, Uneven Ground.—Some Others do not.
Works Perfectly in Tall, Heavy Grain.—Some Others do not.
Works Perfectly in Light, Short Grain.—Some Others do not.
Works Perfectly in Badly Lodged Grain.—Some Others do not.

Strongest Frame, Simplest Construction, Lightest Draft, Greatest Durability, Most Easily Managed. GREAT IMPROVEMENTS for 1890 place it farther than ever in the lead of pretended rivals.

OUR ASSORTMENT OF GRAIN AND GRASS-CUTTING MACHINERY is made complete with our

DEERING LIGHT REAPER.
DEERING GIANT MOWER.
DEERING LIGHT MOWER. } Each the Leader in its Class.

Our DEERING BINDER TWINE made by ourselves is the best in the world. We are the only Harvester Manufacturers who adopted this practical method of protecting farmers against poor Twine.

Apply to our nearest agent for Illustrated Catalogue and Full Information or write direct to us.

WM. DEERING & CO., Chicago.

The Oil-Stone and Grindstone.

W. E. PARTRIDGE, NEW JERSEY.

Every farmer needs an oil-stone, whether he has a shop or only a box of tools. Most men who do any wood-work have such a stone, but the way in which it is treated makes it nearly useless. Reform is easy. Get some glycerine—a common grade will do—and, if a half pound or pound is bought at a time, it will not be costly. Its first use will be to clean off the stone and get rid of all the gum. When the stone is ready for use, the glycerine is always to be employed instead of oil on the stone. This improves the cutting. The glycerine does not dry up. Even though the stone be laid away for months, there will be no hard dirt or gum on the surface. If dusty, it can be washed off with water. Another advantage is that the glycerine may be used with either oil or water. If it is lacking, water can be used for a time without harm. Nor will its use prevent a return to glycerine or oil if it is ever necessary to use the latter.

For the grindstone, it is time to abandon the water-trough. Where the stone stands in the water it becomes soft, while the dry side retains its natural hardness. After a little, this results in its getting "out of round," and then it is almost impossible to do any satisfactory work. The trough itself is a receptacle for dirt and the mud from the stone. The water when grinding is nasty and a decided nuisance. Discard the trough. Put a bracket or shelf up over the stone, and upon it mount a can with a hole in one side at the bottom. A pine stick in the hole will regulate the flow of water, and then the grinding can be done with that luxury, just water enough and no more. The water is clean, and comes exactly on the right spot. When the work is finished, the can is emptied and the stone is safe. Turning the can upside down saves it from becoming a dirt-trap, and it is ready for business in a moment.

Almost all grindstones in the country are a little out of true. This is taken to be something that cannot be helped, although nearly every one has a tradition that a stone may be made true by "grinding it with a nail rod." Rods cost money and do not grind very well. So the stone is never rounded up. Get a piece of inch gas- or steam-pipe. Fix a good rest across the face of the stone, parallel with the axle, and use the end of the gas-pipe as a tool. Traverse the tool from side to side with a rolling motion. If this is done as soon as the stone shows any signs of "wabbling" the task of keeping it true is not a difficult one. The only precaution needed is to have a strong man at the grindstone crank. If one is fortunately provided with power, the task is of course easy. It ought to turn with as little tremble of the edge as a well-balanced top when "sleeping."

Important Points.

No charge whatever is made for the simple Book for Reports. It tells all about the new potato contest (there are only ten simple rules), the questions to be answered in making out the report, with blank pages to write the same upon, and forms for the surveyors' and harvesters' reports. Every one interested can get this book free by applying to the AMERICAN AGRICULTURIST for it.

W. H. Weightman, an Illinois farmer who has entered the new potato contest, writes: "I consider this Prize Crop Competition as a most unusually meritorious matter. I am sure it will result in a vast amount of good to cultivators."

Manuring for the Potato.

Four loads of stable-manure were applied just before planting, being broadcasted and harrowed in. It was obtained principally from horses which had been fed upon corn chiefly. The value of the manure was about $6, and the cost of hauling about $1.50. It was about six months old, and was turned and pulverized six times. In addition to this, one and one-half tons of Stockbridge potato manure were applied, one-half ton of bone phosphate, manufactured by the contestant (which analyzed three to four per cent of ammonia and forty-five to fifty per cent of bone phosphate), and one-half ton of hard-wood ashes. The bone and ashes were mixed and applied broadcast on the sod, March 18. The cost of the Stockbridge fertilizer was $21.50, bone $16, ashes $7—total $44.50. The cost of applying was $1. The manure was carted to the contest acre, put in a Kemp's manure-spreader and broadcasted, which did the work in three hours, and far exceeded hand-spreading. The ground was then harrowed twice with an Acme harrow, then rolled, then furrowed with Hench & Drumgold's corn-planter, which opened two furrows at once and distributed the fertilizer at the same time by means of a cultivator-tooth attached to the machine. The mixing of the fertilizer was also done at the same time, which the contestant thinks far exceeds the old way of dragging a chain. Thus, the furrowing, mixing of the fertilizer, and the distributing were all done at the same time, better than by hand, and in less than half the time, by one man and one team. The special potato manure was all used in the rows.

J. J. DILATUSH, Mercer Co., N. Y.

Neither in America nor elsewhere is there published a better magazine for farm and home than the AMERICAN AGRICULTURIST (Orange Judd Co. New York), which has just entered upon its forty-ninth volume. It is hard to see how it could be improved.—*Boston Times.*

WHEN THE HAIR

Shows signs of falling, begin at once the use of Ayer's Hair Vigor. This preparation strengthens the scalp, promotes the growth of new hair, restores the natural color to gray and faded hair, and renders it soft, pliant, and glossy.

"We have no hesitation in pronouncing Ayer's Hair Vigor unequaled for dressing the hair, and we do this after long experience in its use. This preparation preserves the hair, cures dandruff and all diseases of the scalp, makes rough and brittle hair soft and pliant, and prevents baldness. While it is not a dye, those who have used the Vigor say it will stimulate the roots and color-glands of faded, gray, light, and red hair, changing the color to

A Rich Brown

or even black. It will not soil the pillow-case nor a pocket-handkerchief, and is always agreeable. All the dirty, gummy hair preparations should be displaced at once by Ayer's Hair Vigor, and thousands who go around with heads looking like 'the fretful porcupine' should hurry to the nearest drug store and purchase a bottle of the Vigor."—*The Sunny South*, Atlanta Ga.

"Ayer's Hair Vigor is excellent for the hair. It stimulates the growth, cures baldness, restores the natural color, cleanses the scalp, prevents dandruff, and is a good dressing. We know that Ayer's Hair Vigor differs from most hair tonics and similar preparations, it being perfectly harmless."—From *Economical Housekeeping*, by Eliza R. Parker.

Ayer's Hair Vigor

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FREE for 6c. our 64 p. book, tells how to procure as much from 1 acre as usually obtained from 100 acres. F. ANDREWS, 328 W. Madison St., Chicago.

Cemented Wells and Drainage.

There is a large tract of country in Northern Wisconsin, covered mainly with timber, apparently level, until it was pierced with railroads, which showed it to be just nicely-rolling land. Settlements made since the advent of the railroads prove it to be very desirable for farming. In some parts there is trouble about water, but that is very easily overcome. Five years ago, I had business there, and my friend, with whom I was staying, was getting water from what he called a spring—a low place where he had made a small excavation. Where wells had been dug, water was found at a depth of about forty feet, and it was quite difficult to find material to stone up the well. Another peculiar feature was, that when a cellar was dug it soon filled with water, and so remained. The country was so level that very rarely could a location be found that would admit of drainage. There was not water enough where it was wanted, and too much where it was not. I proposed to my friend to dig a well and cement it. This would take the place of stone, and shut out the surface-water which leaked into the well, to the injury of the water. He objected upon the ground of extreme cold. He had known an open well twenty feet deep to freeze. I proposed to send him three barrels of cement, if he would dig a hole five feet square and six feet deep and curb, leaving a space six inches behind the curbing, and the six-inch space behind the lumber curbing was to be well filled with a grout made of the cement, sand, and stone. This was done, and a circular excavation carried down about three feet three inches in diameter. This was well cemented as it was carried downward until water was reached at forty feet, in quicksand. A tube was settled about four feet in the sand, and an inexhaustible supply of water of the best quality was obtained. The well was covered with two layers of two-inch plank. It has proved to be frost-proof, insect-proof, and proof against all drainage from seeping of foul surface-water. Wells dug, stoned up, and covered in the ordinary manner, are liable to insect and reptile entrance. Large quantities of surface-water soak into the well with open stoning, many times to such an extent that the mass gives away and caves in. In the case of the cemented well, all impurities are kept out. I have spent over fifty years pioneering, and have noticed with interest the attention of scientists to the subject of drainage and sanitary questions, in the older parts of the country, and I cannot avoid the conclusion that cemented wells can be made to greatly aid in securing pure water. I visited my friend about a year ago, and found the well all right, and apparently good for ages, if the top is kept well covered.

F. C. CURTIS, Columbia Co., Wisconsin.

Crops in the Mississippi Valley.

Field-crops, vegetables, and fruits yielded very abundantly here last year. There is a great "surplus" of farm products. Yellow corn proved superior to the white. We have had a very mild winter. This is a great pickle region. As high as 2,000 bushels of tomatoes are produced from six acres of land. Present average price of corn, twenty-five cents; honey, ten cents. Excellent valley land sells at thirty to forty dollars per acre. About thirty per cent of this Mississippi bottom is devoted to winter wheat. Prices of stock and farm products have about reached the lowest limit.

JASPER BLINES, Clark Co., Mo.

Scientific Notes.

How to preserve eggs in times of cheapness until the market advances is an important matter to both producers and consumers. The stations can perhaps solve the problem.

Prof. W. E. Stone finds that the saccharine substance in sweet potatoes is in the form of sucrose or pure sugar. Fresh potatoes may contain two per cent of sucrose—enough to determine the amount with the polariscope. The temperature of cooking (baking) inverts the sucrose, and converts more or less of the starch into a soluble form.

Prof. Riley is confident (Insect Life, Vol. 2, No. 7, Page 261) that the spraying of fruit trees with arsenical insecticides will not prove injurious to the bee gathering honey from the blossoms of such trees. "The prevailing belief is, however, the other way, and cases are on record where serious destruction of bees has resulted from spraying. In the case of the apple, particularly, the application should not be made until the bloom has begun to fall, when no injury will be likely to result." According to the best experience, such insecticides are most effective when applied after blooming, but on the apple while the calyx end of the small fruit is still uppermost.

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(7) Thousands of people telling each other of our honorable treatment of customers, and excellent wear and fit of our clothing.

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Telling Figures

—FROM THE—

Forty-fifth Annual Report

—OF THE—

New-York Life Insurance COMPANY,

OFFICE: Nos. 346 and 348 Broadway, N. Y.

JANUARY 1, 1890.

TOTAL INCOME, over twenty-nine million dollars.

BENEFITS TO POLICY HOLDERS, over twelve million dollars.

INTEREST INCOME, nearly five per cent. on average net assets.

NEW INSURANCE WRITTEN, over one hundred and fifty-one million dollars.

ASSETS, over one hundred and five million dollars.

SURPLUS, by the New York State Standard, over fifteen and a half million dollars.

INSURANCE IN FORCE, over four hundred and ninety-five million dollars.

All these items show increases over the figures of 1888, from an increase of over three hundred thousand dollars in Interest Receipts, to an increase of seventy-five millions in Insurance in Force.

SUMMARY OF REPORT.

BUSINESS OF 1889.

Premiums	$24,585,921.10
Interest, Rents, etc	4,577,345.14
Total Income	$29,163,266.24
Death-claims and Endowments	$6,252,095.50
Dividends, Annuities, and Purchased Insurances	5,869,026.16
Total to Policy-holders.	$12,121,121.66
New Policies Issued	39,499
New Insurance Written	$151,119,088.00

CONDITION JAN. 1, 1890.

Assets	$105,053,600.96
*Divisible Surplus, Co's New Standard	$7,517,823.28
†Tontine Surplus	7,705,053.11
Surplus, by State Standard (4 per cent)	$15,600,000.00
Policies in Force	150,381
Insurance in Force	$495,601,970.00

PROGRESS IN 1889.

Increase in Interest	$303,653.06
Increase in Benefits to Policy-holders	1,148,051.61
Increase in Surplus for Dividends	1,716,849.01
Increase in Premiums	3,458,330.35
Increase in Total Income	3,761,983.41
Increase in Assets	11,573,414.41
Increase in Insurance Written	26,099,357.00
Increase in Insurance in Force	75,715,465.00

*Exclusive of the amount specially reserved as a contingent liability to Tontine Dividend Fund.

†Over and above a 4 per cent. reserve on existing policies of that class.

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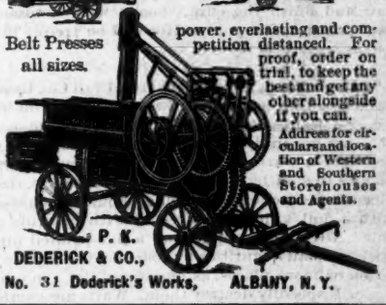

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Send for catalogue and names of some of our well satisfied customers in your section.

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HAIR ON THE FACE, NECK, ARMS OR ANY PART OF THE PERSON

DISSOLVED AND QUICKLY REMOVED WITH THE NEW SOLUTION

MODENE

AND THE GROWTH FOREVER DESTROYED WITHOUT THE SLIGHTEST INJURY OR DISCOLORATION OF THE MOST DELICATE SKIN. DISCOVERED BY ACCIDENT.

In Compounding, an incomplete mixture was accidently spilled on the back of the hand, and on washing afterward it was discovered that the hair was completely removed. We purchased the new discovery and named it MODENE. It is perfectly pure, free from all injurious substances, and so simple any one can use it. It acts mildly but surely, and you will be surprised and delighted with the results. Apply for a few minutes, and the hair disappears as if by magic. It has no connection whatever with any other preparation ever used for a like purpose, and no scientific discovery ever attained such wonderful results. **IT CANNOT FAIL.** If the growth be light one application will remove it permanently, the heavy growth such as the beard or hair on moles may require two or more applications before all the roots are destroyed, although all hair will be removed at each application. Young persons who find an embarrassing growth of hair coming, should use Modene to destroy its growth. **RECOMMENDED BY ALL WHO HAVE TESTED ITS MERITS.—USED BY PEOPLE OF REFINEMENT.**

Gentlemen who do not appreciate nature's gift of a beard will find a priceless boon in Modene, which does away with shaving. It penetrates the hair follicle or sac and dissolves the life principle, thereby rendering its future growth an utter impossibility, and is guaranteed to be as harmless as water to the skin. Modene sent by mail, in safety mailing cases, postage paid (securely sealed from observation) on receipt of price, **$1.00.** Largest size bottle, containing three times as much Modene, and sufficient for any case; **$2.00** per bottle. Send money by letter, with your full address written plainly. Correspondence sacredly private. Postage stamps received same as cash. (BE SURE TO MENTION YOUR COUNTY AND THIS PAPER.)

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$1,000 REWARD. To assure the public of the merits of Modene, we send with each bottle a legal agreement to forfeit **$1,000** to any Purchaser if Modene fails to permanently remove the hair, or discolors or injures the skin in the slightest manner, or produces any unpleasant sensation or feeling when applying or ever afterward. **EVERY BOTTLE GUARANTEED.** (Cut this out.)

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Send for large Illustrated Catalogue.

FARM WAGONS — Best Wagon made $50. Buggies, Carriages, Harness, etc., at ½ price. Send for list. **Chicago Scale Co.,** Chicago.

ANIMAL AILMENTS.

Poor Jersey Cow.—Mrs. Jane McReady, Toronto, Canada, bought a Jersey cow very cheap at a venue. She gives but little milk, and that has very little cream. She wants to know how to make her give more milk with more cream, and if it is best to cross the breed. We answer, that more than half the cows do not pay for their keep. And we advise the keeping only of good cows, and keeping them well. These are the only ones that pay.

String-Halt.—A. Townsend, Shawnee Co., Kan., has a fast-trotting mare that moves one hind leg quick enough to go a mile a minute, but keeps the other three from going a mile in 2:30. Advice is asked how to slow down one leg and hurry up the others. The best thing to be done in all such cases is the *future cure*. Breed your mare to the best and fastest stallion, and the foal will probably have four even-gaited legs; ones that will go fast all over.

Incoming Cows.—Never keep a cow in stanchions while calving. Aside from the brutal barbarity of such an act, and the danger to the cow herself, it is quite liable to spread abortion among other cows in the same stable. Remove the cow to a roomy box-stall, or empty compartment, a few days in advance, so that she may become accustomed to it before the critical hour arrives; and keep it well littered. Anything that worries or excites a cow induces milk fever.

Fetlock-Joint Sprain.—S. T. Moore, Santa Barbara Co., Cal., has a valuable mare that becomes lame frequently from driving. She has had two colts. We think a valuable brood-mare that is thus liable to lameness should be put in the breeding stud. Local treatment for such lameness would be stimulating liniments of spirits of turpentine, spirits of camphor, and tincture of arnica, equal parts, hand-rubbed in vigorously night and morning, for a long time.

Fits in a Cow.—Frank Hamilton, Nova Scotia, has a cow that has fits. She has a ravenous appetite, and is always thin in flesh. The trouble is indigestion, probably. As the cow is farrow, we advise the fattening and slaughter of such a cow. Dry her, and feed small but frequently of good digestible food. Cut-hay dampened and mixed with wheat-middlings every night and morning, and two other feeds daily of ground grains and roots, ought to fatten the cow in two months. A warm stall saves many feeds.

Remedy for Lice.—James Marlowe, Travis Co., Texas, has on his farm a fine heifer that is "dreadfully troubled with lice." She runs in the shed where the hens roost, and she is so gentle that the hens roost on her back. He wants to know how to get rid of them. Separate the heifer and hens. Use carbolic acid—crude, in warm soapsuds—then, with a coarse sponge nearly squeezed dry, rub the heifer all over against the hair, and shut her up for a couple of hours twice a week. To smooth the hair and finish the cure, sponge with kerosene once or twice, and your heifer will be free of lice and as smooth as silk.

"Cancer Wart."—John Tuckett, Utah Co., Utah, has a colt that has a so-called cancer wart on his leg, and desires to know what will kill it. Cancer does not generally appear in warts in colts. It is probably a wart on the colt's leg. Small warts may be tied off by a silk thread. Large ones, that bleed from friction or rubbing, should be scraped with a dull knife, and dressed with chloride of zinc. Nitric acid applied on a fine-pointed pine stick in small quantities by touching the wart in a dozen or more places, as one would dot i in writing, will speedily destroy them. Warts are excrescences or growths in the thin parts of the skin, and nitric acid eats into the roots, and is therefore a thorough application, or killer of warts.

Poll-Evil.—S. G. Wood, Jefferson Co., Ala., writes us that he has a horse that has a "running sore" on his head just back of the left ear, which does not get well, and wishes to know what it is, and what treatment should be used. The disease is *poll-evil*, and is the result of an injury, a blow or bruise, by the horse hitting his head against a beam, door, or tree. It is sometimes caused by a tight, cruel check, or bearing rein. The ulceration is a slow and tedious process, and requires careful, thorough, and persistent treatment. Cleanse with carbolic acid largely diluted with warm water—a drachm of carbolic acid to a quart of water—and then keep the opening free, so that the pus does not bury itself in the surrounding and deeper tissues, forming troublesome sinuses or tortuous channels. The trouble is so formidable, that an educated veterinarian should be consulted.

Hemorrhage.—Animals are sometimes liable to bleeding from the nose, stomach, mouth, lungs, or bowels. Cold sponging will often stop the bleeding. So will hot applications, if the hemorrhage is local and readily reached. Alum water or ferric alum in strong solution is a valuable remedy in bleeding from the nose or mouth. Generally, in animals, bleeding comes from blows, injuries, or leach bites, and seldom requires any treatment, except when dangerous. Cuts sometimes bleed profusely. If the wound can be reached, pressure will soon curtail or stop the bleeding. If on the limbs, firm pressure by bandaging may be resorted to with success. In severe cases, the white hot iron may be required. It should be pushed down to the bleeding vessel with firmness, and repeatedly, and applied unless stopped. The bleeding animals should be kept perfectly quiet, as the least movement encourages bleeding.

Fistulous Withers.—A subscriber in Crawford, Ark., has a horse that, from the slight history of the case, we presume has fistula of the withers. He says a "horse doctor" cut away about ten pounds of flesh, and now thinks "there is more flesh that ought to come away." As there seems a disposition on the part of both doctor and owner to deal largely in horse-flesh, why not slaughter the horse first in a humane way, and then dispose of the entire equine carcass? Fistulas result from bruises, and should be treated early and thoroughly. A long passage of "matter" under the skin is slow to heal, and the surgeon opens the part and treats the wound by inducing granulation from the bottom of the wound. We advise our correspondent to cleanse the same night and morning, and apply lint, wet with chloride of zinc, say a drachm dissolved in an ounce of water. Sinuses, or tortuous passages, must be opened and then treated as above directed.

Chronic Cough in the Horse.—Charles Riedel, Sherman Co., Neb.: This is both a troublesome and annoying affection. It may have its seat in the throat, lungs, air passages, or even in the stomach or bowels. It may arise from worms, irritation, or from morbid sensibility of the nerves of the larynx or of the mucous membrane of the air passages, as a result of influenza, bronchitis, or pneumonia. Animals are similarly afflicted as man. Indigestion causes irritation of the highly nervous tissues of the stomach, causing a chronic cough, which is cured only by the relief of the indigestion. The irritation caused by worms or constipation often causes cough, which only subsides with relief of the original cause. The irritation arising from eating coarse and musty dry hay often produces cough. Heaves, enlargement of the air-cells, and over distension of the stomach result in cough, and especially when horses are hard driven in this condition. Therefore, to relieve chronic cough, the cause must be removed. When irritation of the larynx produces cough, it may be relieved by external irritation of the neck over this organ. For this purpose, a folded piece of flannel, wet with spirits of turpentine, covered by paper, and bound on with a long fold of muslin, should be used. In the hairy part of animals it takes several hours and repeated applications to get up irritation of the skin. Tar applied to the tongue before feeding will be of service. Whole linseed in the food—a handful in each feed—and digestible, clean, and moist food will aid. The hay should be cut, moistened, and mixed with the ground oats. Carrots are also desirable, as also are white Jerusalem artichokes, finely cut, and sprinkled with ground oats, to get the horse accustomed to them. In cases of indigestion, ground gentian, an ounce, and linseed, whole, a handful, should be added to the usual feed. And, when constipation exists, a handful of glauber salts with the above will be especially useful, to which a tablespoonful of ground saltpeter may also be added, to aid the functions of the kidneys. When the cough is dry, half a teaspoonful of muriate of ammonia will be of essential service, added to either of the above adjuncts. The horse should be kept in a dry, warm box-stall, well littered, and kept clean. He should have good, sound food, pure water, gentle care, and kind treatment.

Foot Lameness in Sheep.—C. Coursall, Ontario, Canada: Lameness or foot-rot in sheep is an inflammation of the superficial tissues of the skin around the hoof. It is like a "run-around" around the human nail, where, according to the tissues, it is called *poronychia*, whitlow, or felon. It results from bruise in man, and from concussion from hard stubble, stone, or extremes of hot, dry, sandy pastures, or wet, cold runs, yards, or pastures. The "matter" burrows about the hoof, and finds least resistance in the thin skin between the clefts of the hoofs, where, if neglected, it extensively destroys the fleshy parts and hoofs, and becomes, like a thorn in the flesh, a constant source of irritation, inflammation, and suppuration. It must be apparent, then, that the thorn—the cause—must be removed. Thoroughly cleanse the foot with warm Castile soap-suds. Then open any abscess; cut away with sharp shears or sharp knife any loose or dead portion of the hoof; thoroughly cleanse daily, and dress with the following: Chloride of zinc, two drachms; tincture of arnica, one ounce; water, a pint. To properly apply the solution, soft pieces of old napkins, or linen tablecloths, should be moistened in it and folded gently down between the cleft of the hoof. Then, with a narrow bandage wound round the ankle in a figure-eight, passing once or twice between the clefts, the dressing will be kept in place. It will be well to cover the whole foot with a piece of old bag. In the soap-suds, a few drops of carbolic acid will remove the offensive odor and aid the cure. All sick, lame, or injured animals should be put by themselves in a warm, dry box-stall, littered with clean straw. In all operations, applications to tender or sore parts of animals, tender and gentle handling should be observed. Sheep and calves are silent sufferers when hurt or harshly treated, but the pig is loud and excessive in complaint on the slightest annoyance; yet we should be humane to all dumb brutes.

Breeders of Ayrshire Cattle.

The Ayrshire Breeders' Association held its seventeenth annual meeting at the Fifth Avenue Hotel, New York, Feb. 20. The attendance was good, and the harmonious spirit prevailed which has always characterized these annual meetings. The following officers were re-elected for the ensuing year: President, J. F. Converse, Woodville, N. Y.; Vice-Presidents, Obadiah Brown, Providence, R. I., F. H. Mason, Leon, Ohio, Wm. Crozier, Northport, L. I., H. R. C. Watson, West Farms, N. Y.; Secretary and Editor, C. M. Winslow, Brandon, Vt.; Treasurer, Henry E. Smith, Enfield, R. I.; Executive Committee, S. M. Wells, Wethersfield, Conn., J. O. Magie, Elizabeth, N. J., J. DeWitt Krebs, Walden, N. Y., I. N. Coldren, Iowa City, Iowa, Geo. A. Fletcher, Milton, Mass., Robert M. Carrons, Washington, Pa. It was resolved that entries for Vol. VIII of the herd-book should close October first. Several proposed amendments to the constition were discussed but not adopted. Resolutions in view of the decease of Wm. Birnie, the first president of the association, were adopted by a standing vote. A resolution of thanks was voted to J. D. W. French for the special premium given by him for best Ayrshire at the latest Bay State Fair. A resolution was adopted authorizing the executive committee to select judges for Ayrshire classes, and recommend them to the managers of the various agricultural and live-stock exhibitions of the United States.

Professor G. H. Whitcher, director of the New Hampshire Agricultural Experiment Station, delivered an address in which he set forth the results of experiments with different breeds at that station.

Mr. Robert Carrons and Mr. Sears, of the New Jersey State College farm, addressed the association on matters of great interest and practical importance.

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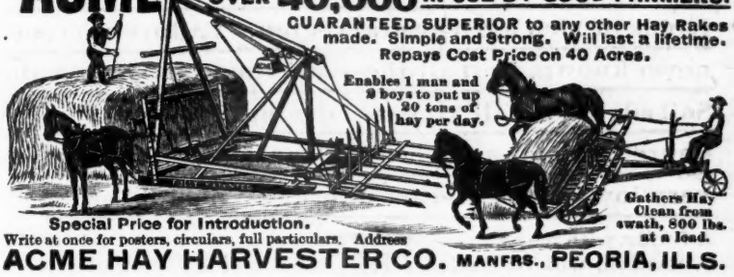

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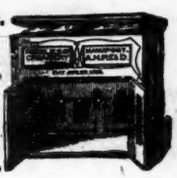

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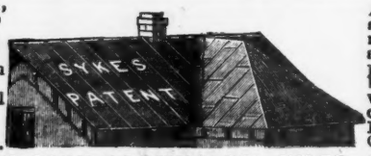

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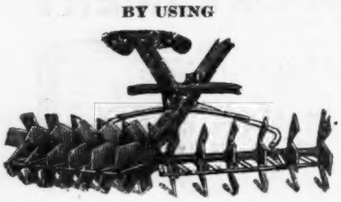

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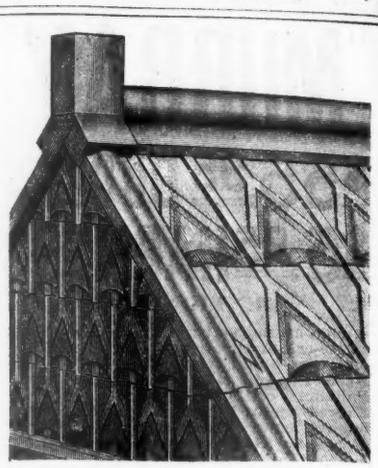

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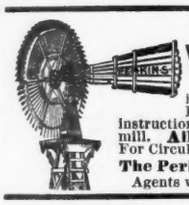

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Farmers as a class are conservative, and averse to innovations. But there is no reason in these days, when the printing-press brings to our doors the accumulated wisdom of the times, why we should not profit by what another has learned. No saying is more unquestionable than that "Everybody knows more than anybody," and so we should read and become familiar with the ideas and experiments of others; and, though we may not always agree with the writer, we are the wiser for having encountered a new phase of the subject. "Reading makes the full man," as truly now as when Bacon wrote the sentence, and a wise farmer will see that such fullness is a part of his life. Now a good plan is as follows: Let ten farmers—or more, if desirable—form a club and each put in a stated sum, say two or three dollars; five would be better, but if only two be given, each will see twenty dollars' worth of reading which bears directly upon his work. A meeting is held at some convenient house, and each tells what paper he wishes most to see and read during the year. There will in all be probably not more than five or six, and at a club rate would not cost more than half the money. Then select four or five books which the most of the members wish to read, and a beginning is made. Put the names of the papers in a hat, with enough blanks so that each one may draw something, and the one who draws any paper is to have the first reading. When he has kept it a week, let him forward it to the person whose name follows his alphabetically. After the first month there will be plenty to read for everybody, and if the list includes some weekly paper there will be a lively interchange all along the line. Let the books start with those who do not have the first reading of a paper, and they can be kept two weeks, and if any one wishes to see the book again, he can do so after it has gone the rounds. We had such a club here and had a blank printed which we stuck on the last page of each publication, so that each one knew where the paper had been before he saw it, and how long it had been kept. If there is a delay in forwarding, a fine of two cents a day may be imposed. These fines will swell the club's funds.

WIDE-AWAKE READING CLUB.

Members.	*When Received.*	*Forwarded.*	*Second Reading.*
John Smith..	January 1,	January 8,	John Smith.
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George Clarke	January 15,	January 24**	

** Two days' fine.

If one does not have time to read a paper or book as much as he desires, he writes his name in the "second reading" space, and the last one of the club who has it returns it to him to be kept another week or more. Of course one will talk more or less with those who are reading the same things that he is, and so will fulfill the other part of Bacon's sentence, "Conversation makes a ready man;" and such reading and conversation might, in a single year, give to ten farmers and their families a mental impetus that would be fruitful of good. The ordinary farmer is not wide awake enough to do his best. He needs the mental quickening that always comes from reading what men and women who are wide awake and far-seeing are thinking and doing.

Let no one say that the long winter evenings are the only time he has to read, for, if that be the case, his reading will profit him little. It almost seems, sometimes, that many people feel that to read and to be profited by it can only be done in the winter, when there is not much else to do. One cannot eat enough at one meal to sustain him for a month, nor can he take in mental food enough in one season to last over another. His mind needs fresh supplies of nourishment as much as his body, and the reading that such a club would furnish will last through the year. If a Farmers' Club or Grange be a part of the community's possessions, any disputed point can be talked over at its meetings. The club's papers may not take altogether the agricultural direction; a paper or two for the farmer's wife and children will be a good deviation from such a rule, and so interest can be aroused along other lines. What we need is to think more, and anything that stimulates such mental action is to every mind a positive blessing.

I am greatly pleased to see more matter in the AMERICAN AGRICULTURIST from California and the Pacific coast. We have lots of country here very similar to the dry parts of California. W. E. ASH, South Australia.

Let Us Explain. Many friends expect to find our knives in every retail store. They call for them, but as we do not drum middlemen, they do not find them, and are coaxed into buying some of the stuff made to *sell* but not to *cut*. We aim to deal direct with consumers. Send for 80-page free list giving points on using and sharpening tools. We have been a life-time learning, and our stock will be before you. Maher & Grosh blades are *hand-forged from razor steel*, warranted. Prices are lower than you pay for trash. This cut is exact size of our 65c 2-blade jack-knife. Blades equal to any $2 razor. Price for the present 48c post-paid; 5 for $2. A little smaller one, price 50c, sent now for 38c. Lady's 2-blade pearl, 35c. 7-in. *Shears* 60c post-paid. 65c Knife and Shears, $1. Pruning knife, 75c; grafting, 25c; budding, 55c; pruning shears, 90c post-paid. Hollow razor, $1.25. Best strop ever made, 50c. **MAHER & GROSH**, 4 S Street, Toledo, Ohio.

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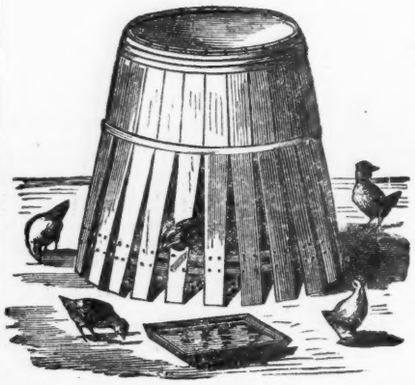

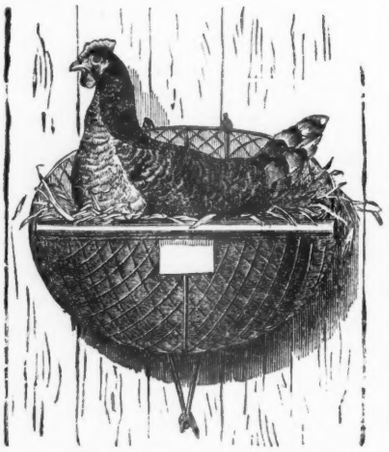

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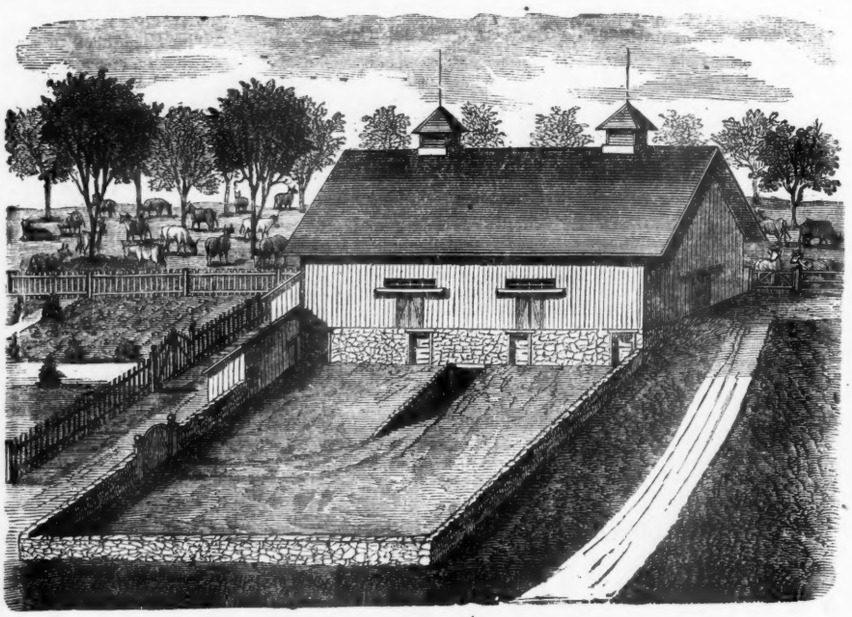

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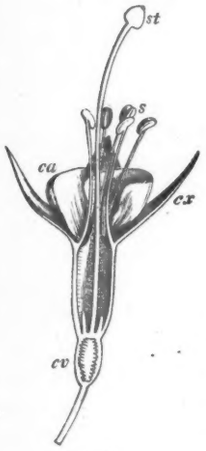

Fig. 61.
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Fig. 36.
SLIP OF A BARLEY ROOT.

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QUANTITY, DISTRIBUTION, AND VARIATIONS OF THE ASH—Table of Proportions of Ash in Vegetable Matter; Special Composition of the Ash of Agricultural Plants; Constant Ingredients; Uniform Composition of Normal Specimens of Given Plants; Table of Ash-Analyses; Composition of Different Parts of Plants; Like composition of similar plants; Variability of ash of same species; What is normal composition of the ash of a Plant? To what extent is each ash-ingredient essential or accidental? Water Culture; Essential ash-ingredients; Is Sodium Essential to Agricultural Plants? Iron indispensable; Manganese unessential; Is Chlorine indispensable? Silica is not essential; Ash ingredients taken up in excess; Disposition of superfluous matters; State of Ash-ingredients in plant; Functions of the Ash-ingredients.

JUST HOW PLANTS GROW—Quantitative Relations among the Ingredients of Plants; Composition of the plant in successive stages of growth; Composition and Growth of the Oat Plant.

DIVISION II. THE STRUCTURE OF THE PLANT AND OFFICES OF ITS ORGANS.

GENERALITIES—Organism, Organs.

PRIMARY ELEMENTS OF ORGANIC STRUCTURE—The Vegetable Cell; Vegetable Tissues.

VEGETATIVE ORGANS—The Root; Offices of Root; Apparent Search for Food; Contact of Roots with Soil; Absorption by Root; Soil Roots, Water Roots, Air Roots; The Stem; Buds; Layers, Tillering; Root stocks; Tubers; Structure of the Stem; Endogenous Plants; Exogenous Plants; Sieve-cells; Leaves; Leaf Pores; Exhalation of Water Vapor; Offices of Foliage.

REPRODUCTIVE ORGANS—The Flower; Fertilization; Hybridizing; Species; Varieties; Fruit; Seed; Embryo; Vitality of seeds and their influence on the Plants they produce; Duration of Vitality; Use of old and unripe seeds; Density of seeds; Absolute weight of seeds; Signs of Excellence; Ancestry; Race-vigor.

DIVISION III. LIFE OF THE PLANT.

GERMINATION—Introductory; Phenomena of Germination; Conditions of Germination; Proper Depth of Sowing; Chemical Physiology of Germination; Chemistry of Malt.

FOOD OF THE PLANT when independent of the Seed; The Juices of the Plant; Their Nature and Movements; Flow of Sap; Composition of Sap; Kinds of Sap; Motion of Nutrient Matters; Causes of Motion of the Juices; Porosity of Tissues; Imbibition; Liquid Diffusion; Osmose or Membrane Diffusion; Root Action; Selective Power of Plant; Mechanical Effects of Osmose.

TABLE—Composition of Agricultural Products.

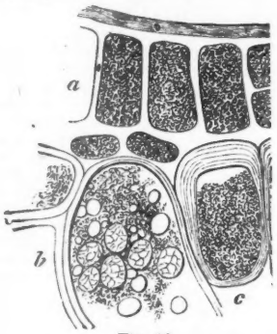

Fig. 18.
PART OF AN OAT KERNEL.

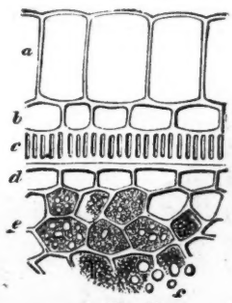

Fig. 19.
SECTION OF A FLAX SEED, SHOWING THE STARCH, OIL, ETC.

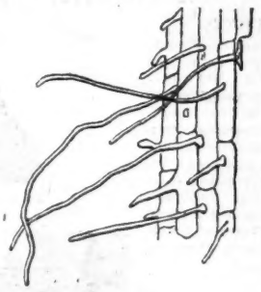

Fig. 39.
MINUTE PORTION OF A BARLEY ROOT, HIGHLY MAGNIFIED.

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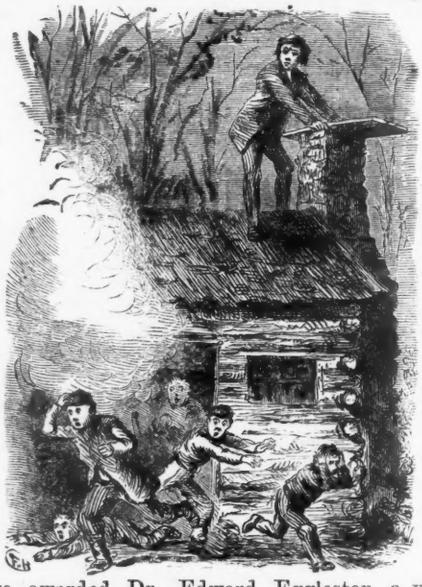

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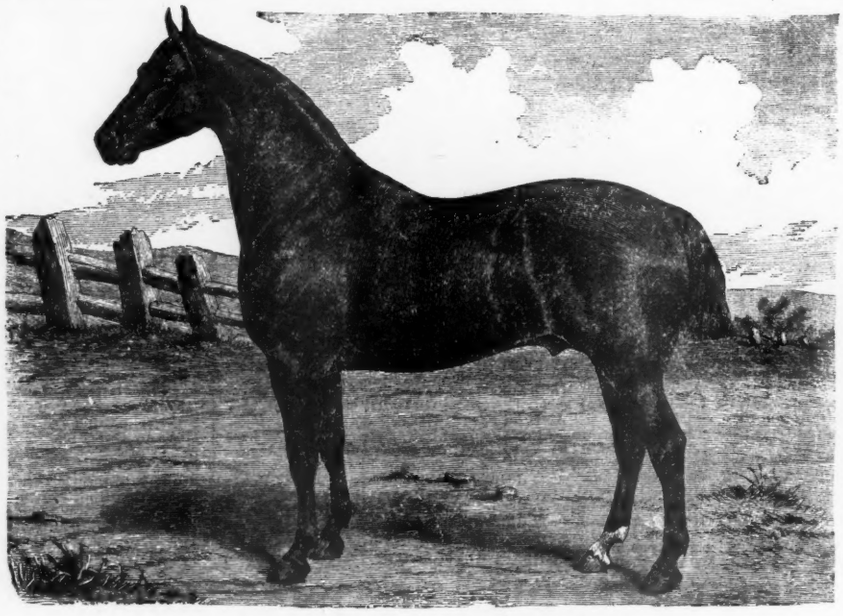

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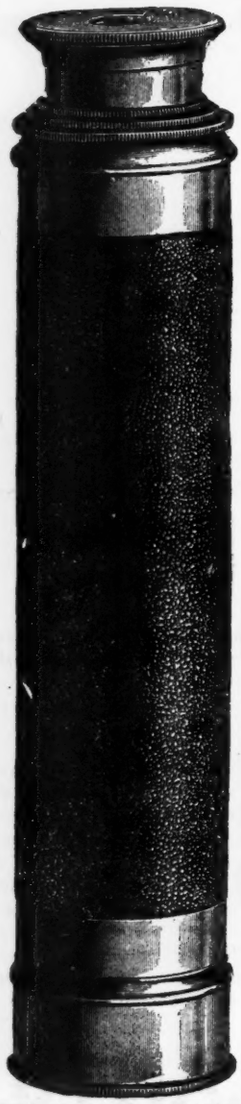

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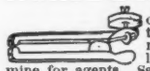

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